

Department for Culture Media and Sport
The Casino Scoping Study (ITT no. 636)



GEMINI RESEARCH



University of Salford
A Greater Manchester University

Scoping Study for a UK Gambling Act, 2005 Impact Assessment Framework

Corinne May-Chahal
Rachel Volberg
David Forrest
Phillida Bunkle
Ian Paylor
Peter Collins
Alison Wilson

June 2007

CONTENTS

Acknowledgements	iv
The Authors	v
How to read this report	vii
CHAPTER 1: SUMMARY OF THE FRAMEWORK	1
1.1 Methodological Background	1
1.2 Potential Impacts: International Research Findings	3
1.3 Methodological Options	10
CHAPTER 2: BACKGROUND AND METHOD	22
2.1 Gambling Impact Measurement in the UK	22
2.2 Scoping Study Aims and Objectives	23
2.3 Scoping Study Method	25
CHAPTER 3: SUMMARY OF METHODOLOGICAL CONSIDERATIONS FOR MEASURING THE IMPACTS OF CASINOS	27
3.1 Crime Impact Assessment	27
3.1.1 Crime Impacts Identified in the Summary Review	27
3.1.2 Summary of Gambling Crime Impact Design	30
3.1.3 UK Gambling and Crime Measurement Considerations	31
3.2 Economic Impact Assessment	35
3.2.1 Economic Impacts Identified in the Summary Review	35
3.2.2 UK Casino Economic Impact Measurement Considerations	37
3.3 Public Health Impact Assessment	48
3.3.1 Public Health Impacts Identified in the Summary Review	48
3.3.2 UK Casino Public Health Measurement Considerations	53
3.3.3 Recommendations for Assessing UK Casino Public Health Impacts	55
3.4 Community and Cultural Life Impact Assessment	56
3.4.1 Community and Cultural Life Impacts in the Summary Review	56
3.4.2 UK Casino Community and Cultural Life Measurement Considerations	59
CHAPTER 4: THE COUNTERFACTUAL	61
CHAPTER 5: IMPACTS OF GAMBLING OUTSIDE CASINOS	65
5.1 Risk and Protective Factors for Problem Gambling Outside the Gambling Act, 2005, Casinos	65
5.2 Dimensions of Gambling Participation	65
5.3 Structural Characteristics of Gambling Activities	66
5.4 Machines Inside and Outside Casinos	67

5.4.1 Machines and Problem Gambling	67
5.4.2 Young People and Machine Gambling	73
5.5 Internet Gambling	74
5.5.1 Youth Internet gambling	76
5.6 Bingo	76
5.7 Betting	77
CHAPTER 6: A UK GAMBLING IMPACT ASSESSMENT FRAMEWORK	78
6.1 Cost Benefit Assessment	85
6.1.1 Casino related consumer surplus	85
6.1.2 Ancillary economic benefits from casino development	85
6.1.3 Displacement	88
6.2 Crime	89
6.3 Public Health, Community and Cultural Life	91
6.3.1 Prospective Longitudinal Survey	91
6.3.2 Longitudinal Sample Design	92
6.3.3 Panel Attrition	94
6.3.4 Measures	94
6.3.5 Longitudinal Module	95
6.3.6 Intercept Study	95
6.3.7 Impacts of New Gaming Technologies	97
6.3.8 Measuring the Impacts of Internet Gambling	100
6.3.9 Youth Gambling	101
6.3.10 Community Level Data Collection	102
CHAPTER 7: ETHICS, SKILLS AND ARCHIVING	106
7.1 Longitudinal Studies	106
7.1.1 Use of incentives	106
7.1.2 Effects on vulnerable people	106
7.1.3 Breaches of confidentiality	107
7.2 Uses of Data	107
7.2.1 ESRC Archiving	108
7.2.2 Disclosure Analysis	108
7.3 Additional Ethics Considerations	110
7.4 An Ethics Standing Committee	111
7.5 Skills	111
CONCLUSION	112
REFERENCES	114

Tables

Table 1: 7 Options for the Impact Assessment Framework	19
Table 2: Gambling Act, 2005, Impact Assessment Framework Studies	79

Figures

Figure 1: Databases for Evaluation Review	26
Figure 2: Summary of Gambling Crime Impact Design	30
Figure 3: Global Consumer Surplus	38
Figure 4: Consumer Surplus of Non-compulsive and Compulsive Players	39
Figure 5: Health and Public Health Impacts Identified in Previous Studies	52
Figure 6: Summary of Public Health Framework for Impact Assessment	54
Figure 7: Draft Framework for Measurement of Crime Impact of Gambling Act Casinos	90
Figure 8: Proposed sampling strategy for a longitudinal study	93
Figure 9: Data Sources for the VLT Player Card Research Project	99
Figure 10: Health Impact Assessment	105

Appendices

Appendix 1 Workshop Participants	
Appendix 2 Current Health Indicators for Integrated Impact Assessment	

ACKNOWLEDGEMENTS

This research was commissioned by the Department for Culture, Media and Sport. The authors would like to thank John Lepper and Stephen Creigh-Tyte of the DCMS, for their supervision and support. In addition to conventional literature review techniques, the literature and findings were subject to appraisal by a range of researchers, policy analysts and practitioners across the world who contributed their time and thoughts with great generosity (see Appendix 1).

All remaining errors and deficiencies in the report are the responsibility of the authors.

THE AUTHORS

Corinne May-Chahal is Professor of Applied Social Science at Lancaster University. She has conducted a range of social research at regional, national and international levels. Project management experience includes; co-ordination of CAPCAE (Co-ordination Action on the Prevention of Child Abuse in Europe involving partners from 8 countries), CUPICSO (Control and Use of Personal Information on Child Sex Offenders) and a review of the research literature relating to gaming machine, lottery and pools coupons practice by children and young people under the age of 18 in the UK (DCMS, Technical Paper No 8, 2004).

Professor Rachel Volberg served as a co-investigator on the national Gambling Impact and Behaviour Study (GIBS), a research program initiated by the National Opinion Research Center at the University of Chicago and its partners on behalf of the U.S. National Gambling Impact Study Commission. She has directed prevalence surveys among adults in approximately 25 states and provinces in North America and has directed or consulted on national prevalence surveys in the United States, Australia, New Zealand, Norway and Sweden along with surveys looking at gambling and problem gambling among subgroups in the population, including adolescents, older adults and Native Americans.

Professor David Forrest has current research interests in the Economics of Sport and the Economics of Gambling, with special reference to Cost Benefit Analysis. He has published extensively in academic journals with recent outlets including Economic Inquiry, National Tax Journal and Scottish Journal of Political Economy. In addition, he is an Academic Advisor on gambling and lottery issues to the National Economic Research Associates (NERA).

The Hon. Phillida Bunkle worked in New Zealand as an academic at The Victoria University of Wellington, and in advocacy and consultancy in the voluntary sector where she has encouraged the collection of comprehensive data about gambling service use and users. Along with other colleagues she developed the public health approach to gambling in New Zealand and addressed the 1999 WHO Health and Local Government Summit and the 2001 WHO Women's Health Summit on the need to adopt this. Her most recent publication is a review of evidence and information about gambling in New Zealand published in the New Zealand Journal of Social Policy.

Professor Peter Collins research interests are on Gambling and Public Policy, with special reference to Ethics and Gambling, Problem Gambling and Internet Gambling. His most recent publication is *Gambling and the Public Interest* (Praeger Books, 2003). He was a specialist advisor to the joint parliamentary Scrutiny Committee on the new Gambling Act and consults widely for governments and the private sector in the UK and abroad.

Dr Ian Paylor is Director of The Applied Social Science Unit for Research and Evaluation (ASSURE) at Lancaster University. He works closely with local authorities, the police and criminal justice organisations, health and voluntary organisations on research and evaluation projects, including evaluating local programmes in the drug and alcohol sector.

Alison Wilson is a contract researcher based in ASSURE and has worked on several projects specialising in drug and alcohol interventions and drug related deaths.

HOW TO READ THIS REPORT

A word from the Department for Culture, Media and Sport...

As the lead Government department responsible for the Gambling Act, we commissioned this project to identify possible approaches for assessing the impact of the Act, so that a co-ordinated approach between the different interests in the sector – public, private and academic sectors – to research in this area could be more easily realised. This report details what could be done with different degrees of investment, recognising that different sectors will have a lesser or greater interest in some aspects more than others.

This is evident in the comprehensive way the team have gone about their task: drawing together a variety of options and frameworks which pick up not only the need for measurement of the direct socio-economic impacts of new casinos – our main interest – but the wider health, crime and social impacts of the Gambling Act. That it should be so comprehensive is beyond question. That such an analysis should be shouldered across the industry is also beyond question. That is why it is vitally important a focal point like this is produced to marshal resources across the sector, to co-ordinate efforts.

The reader should note that the views expressed here are the authors' and do not necessarily reflect the views of the Government or the Department for Culture, Media and Sport.

Chapter 1 provides a very brief review of the impacts identified in the scoping study and focuses primarily on a summary of the options for measuring the impact of the new Gambling Act casinos and the development of new gambling opportunities in the UK. This is the main outcome of the scoping study and the rationale for it can be found in the ensuing chapters.

Chapter 2 provides details of the aims, objectives and methodology of the scoping study. Chapter 3 contains an in depth review of casino related impacts and their measurement from the international literature. Each section, on crime, economic, public health and cultural impacts also considers measurement in a UK context. Following this, we review methods of dealing with the counterfactual (Chapter 4); how can it be certain that impacts are derived from casinos and not some other source and what might have happened if no casino had been licensed? Chapter 5 considers the impacts of new gambling opportunities relevant to the 2005 Act outside casinos, such as Internet, machine and youth gambling and various methodological options for their study. A UK Gambling Impact Assessment Framework with estimated outline costings is presented in Chapter 6. Finally, in Chapter 7 the report addresses ethical and skill based issues that should be considered in the implementation of the framework and also data archiving and access for secondary analysis, given the inevitable investment that such data collection requires.

CHAPTER 1: SUMMARY OF THE FRAMEWORK

This summary section performs three functions. First, it briefly sets out the background to the issue of measurement of social costs and benefits. Second, it summarises what international research has to teach about the possible social and economic impacts of the new casinos. Third, it presents a series of alternative research strategies designed to measure the expected impacts of the new Gambling Act, 2005 casinos for consideration. The main report covers each of these areas in more detail and additionally considers the measurement of impacts of gambling developments outside casinos, in particular, the expansion of Internet gambling and machines outside casinos. Evaluation of economic and social benefits and costs arising from the Gambling Act 2005 (including the 17 Gambling Act casinos) must be informed by an understanding of what goals the Act hoped to achieve. We start from the three main principles of the Gambling Act:

- Keeping gambling crime free
- Making sure that gambling is fair and open
- Protecting children and vulnerable adults

In addition areas of particular interest are:

- Social and economic effects on the local area and region in which the casinos are located as well as on the wider society,
- Consequences for the overall gambling environment locally, regionally and nationally and
- Any resulting change for the cultural life of Great Britain.

The framework is designed to enable an assessment of whether outcomes of the Act are likely to be worth the cost. All the studies recommended are designed to be ‘SMART’ (HM Treasury, 2003), that is;

- Specific to a gambling related cost or benefit,
- Measurable through the application of validated research methodologies,
- Achievable according to the limits of existing data collection and the level of new investment required,
- Relevant to the principles and provisions of the Gambling Act 2005, and,
- Time-bound in order to enable reasonable assessment of costs and benefits post implementation.

1.1 Methodological Background

The Gambling Act 2005 introduces many changes to the gambling environment and increases the number and types of casino licenses. The Minister has assured Parliament that the social and economic impacts of these developments would be carefully measured and evaluated so as to ensure that the intention of the Act to protect young people and vulnerable populations from harm and exploitation is being fulfilled. She stated that,

‘we cannot and will not even consider allowing further casinos until a proper evaluation over time has been made of the social and economic effects of the 17 casinos’ ([Casino Advisory Panel Statement by Tessa Jowell - 30 January 2007](#))

An international team of experts has been contracted to develop options for the accurate measurement and evaluation of these impacts, enabling proper co-ordination of any subsequent research – whoever it is carried out by – allowing a more robust picture of the impacts to be built.

What counts as an impact?

There are wide ranging debates as to what does and what does not count as a gambling related social cost or benefit. In some socio-economic models, based on the idea that society is made up solely of rational individuals, costs are counted as ‘social’ only if they are external to the transaction between the gambling provider and the individual gambler. Others may see human behaviour as not merely a sum of individuals acting in isolation from each other but rather as composed of many interdependencies. In that case, most individual actions have a social component and most social actions have an individual one. In such a model, the usual commonsense list of social costs and benefits would be included along with the uncontroversial individual ones.

There is less difference between these approaches than might appear at first sight. The atomistic world assumes that the social is part and parcel of individual costs and benefits. If that is not the case then some separate account must be taken of it. At the same time the collective world assumes that individual costs and benefits are incorporated in those of society. In practice, then, the choice of approach comes down to an analysis of who is bearing the cost – the individual or society.

A further enduring issue in impact assessment is establishing that gambling is the definitive cause of social change. For example, if excessive gambling leads to relationship breakdown and divorce, would that divorce have happened anyway? Answering this question requires careful, detailed and rigorous methodologies that monitor a range of impacts and contexts over time. Although a few new studies in other countries are beginning to address this, no study to date has conclusively established links between cause and effect because their methods have not allowed it.

The approach taken by the research team has been to identify a full range of gambling related costs and benefits (impacts). These were broadly grouped under Crime, Economic, Public Health and Community and Cultural Life impacts. Summary reviews, workshops and consultations focused on identifying individual and social costs and benefits, along with the complexity of relationships between impacts. We have reviewed the ways in which impacts have been measured elsewhere in the world, and considered those methods in the context of the UK

The limitations of existing research in the UK

To date there has been little research on the impacts of legal, commercial gambling in Great Britain. An early report by Brown and Fisher (1996) and a recent report for the Scottish Executive

(Reith and ScotCen, 2006) are the only UK specific studies located. The Scottish report concluded that:

- Evidence on the impacts of gambling for the U.K. is ‘extremely thin and much of the available material is methodologically weak and open to interpretation’ (Reith & ScotCen, 2006, p12);
- Only limited research has been conducted with sample sizes sufficient to robustly identify problem gambling impacts;
- Little research tracking changes over an adequate amount of time has been undertaken.

1.2 Potential Impacts: International Research Findings

International academic research literature suggests that the expansion of casino gambling in England and Wales may be associated with a range of impacts under the four areas identified; namely, economic impacts, crime, public health issues and culture and community issues.

a) Economic impacts

i) Benefits

Eadington (1999) distinguished three areas of benefit or gain from permitting new gambling facilities:

- Benefits to users (consumer surplus)
- Ancillary economic benefits from casino development
- National and local government benefits

Potential costs of casino developments derive from problem gambling, increases in criminal activity and degradation of the environment (whether direct or indirect through extra travel generated by trips to geographically isolated facilities).

Displacement of existing gambling and leisure pursuits is not a social cost but the impact may be of interest to policy makers as losers may include, for example, Good Causes reliant on Lottery funding or the UK horse breeding and racing industry. For example, in some Australian states, expansion of machine gaming appears to have lowered sales of on-line lottery games by 20-30%. In the US, and New Zealand many horse racing venues have been authorised to offer large scale machine gaming themselves thus leading to an overall expansion of gambling opportunities.

ii) Issues and Limitations of Research into Economic Impacts.

The measurement of actual consumer surplus should be central to monitoring the consequences of the Gambling Act, however a great deal of this net measurement depends upon how the costs of problem gambling are measured and analysed. Furthermore, the various benefits and costs are not

independent of each other but interact in a variety of ways highly dependant on particular local variables.

iii) Consumer surplus

The most comprehensive of government investigation of the costs and benefits of gambling, the Australian Productivity Commission (1999), while careful in its assessment of negative social impacts, nevertheless reported very high estimates of consumer benefits for non-problem (recreational) players. Similarly, work at the University of Nevada, Reno and the University of Salford, (Marx (2002), Crane (2006)) forecasts consumer surplus from new casinos in Britain to dominate even pessimistic estimates of social costs from problem gambling.

There are, however, serious difficulties in relation to how casino specific recreational and problem gambling are to be distinguished, how the costs of problem gambling are to be estimated, and the sensitivity of these estimates to the subjective decisions of analysts (further details of these difficulties are provided later in the report). The Australia Productivity Commission found that obtaining sufficient data on problem gambling is critical if the measure of consumer surplus is to be accurate.

iv) Regeneration

The international evidence for regeneration and employment benefits is highly variable and cannot be extrapolated easily to British sites. To the extent that the siting of the 17 new casinos in Britain is driven by expectations of regeneration, success in achieving the hoped for benefits should be assessed in any review of impact on aggregate social welfare.

v) Benefit to Government

Any net taxation benefit to Central Government is likely to be fixed but the benefit to local government will depend upon their skill in managing license distribution.

b) Crime impacts

Several studies have examined the crime impacts of casinos in general terms (Buck et al, 1991; Chang, 1996; DCPC, Stitt et al, 2003; US General Accounting Office, 2000; Nuffield & Hann, 2000; Nichols et al, 2002; Parliament Victoria, 2002; Evans & Topoleski, 2002; Gazel et al, 2001; Ortiz & Corcoran, 2004; Phipps, 2004; Baxandall & Sacerdote, 2005; Grinols & Mustard, 2006). The literature is contradictory, depending on the method used, particularly on whether increases in visitor numbers, changes in policing and impact assessment over time are included in the study design. Potential **crime impacts** include:

- 'In-house' crime within casinos (rarely reported externally)
- Crime committed in order to acquire funds to gamble or pay off gambling debts (impacts on families, workplaces and communities)
- Crime as a by-product of gambling behaviour (impacts on families, workplaces and communities)

i) Issues and Limitations of Research into Crime Impacts of Casinos

There is no single comprehensive study that includes sufficient time to monitor change pre-post casino, accounts for population variables and measures of both reported and unreported crime specifically linked to gambling:

- Grinols and Mustard (2006) and Gazel, Rickman & Thompson (2001) established some theoretical links between crime and casinos in the US. However, these studies look at reported crime available from policing/criminal justice data sets.
- Studies tend to be focused on clinical or prison populations which may not be generalized to community populations.
- Similar difficulties exist with studies of deviant or antisocial behaviour such as litter, noise, nuisance and small scale disorder.
- When casinos are situated in areas in need of regeneration, it is necessary to consider whether their impact is to reduce crime or displace it to other areas in the locality.
- Possible deterrent effects of high standard venues, through increased surveillance and safe design have not been researched.
- There maybe significant variation between casinos located in different communities and over various time periods.

c) Public Health Impacts

Over the past decade, discourse about gambling problems has shifted from a medical model to a broader public health model. The medical model focuses on the ill individual; the public health model shifts attention to a population group and its environment. Attention is focused on common factors linking behaviour to social arrangements and, thus, contributes data on causality. Studies of **public health casino impacts** should;

- Be population based;
- Collect data that enables multi-factorial and multi-causal assessment of casino impacts;
- Recognise dynamic relationships which change over time, especially in relation to co-morbidity with other health problems (drugs, alcohol, psychiatric disorders), emerging gaming technologies and problem gambling ‘flow’¹;
- Concerned with identifying and promoting healthy environments, problem free gambling and economic well being as well as identifying and treating pathological problem gambling;
- Inform preventative strategies which minimise gambling harm.

In order to assess the impact of the Gambling Act, 2005, casinos research would need to draw on sufficient sample sizes to detect patterns and relationships between different variables; to identify individual (host), agent (machines, games) and environmental (casino host responsibility

¹ Problem gambling ‘flow’ refers to the way in which people move between being at risk to becoming problem gamblers and the way in which some will continue with a life time prevalence whilst others will recover and relapse.

programmes, practices that encourage gambling, family and community strengths and vulnerabilities) characteristics that are productive of gambling harm or that minimize that harm. Problem prevention in this case consists of the application of collective resources to changing environmental conditions rather than to mechanisms within individuals. Policy can affect each of these types of factor, and so all three should be of concern in measuring impacts.

i) Possible positive effects.

Positive effects include the difficult-to-quantify value of the recreation that consumers derive from gambling. While there is as yet little empirical support, commentators have pointed out that there is theoretical support for the notion that gambling may provide important health benefits, such as a sense of connectedness, a change of pace, a respite from social isolation or the demands of everyday life (Korn & Shaffer, 1999).

ii) Individual Problem Gambling Health Impacts

Stress disorders

Pathological gamblers have been found to be at heightened risk for a number of stress-related physical illnesses and psychiatric disorders including hypertension and heart disease (Lesieur, 1998; Volberg, 2001a) high rates of depression and suicidal ideation (Abbott et al, 2004; Gerstein et al, 1999; Polzin et al, 1998a; Smith, Volberg & Wynne, 1994; Specker et al, 1996; Thompson, Gazel & Rickman, 1996). Several researchers have argued that suicide attempt rates among pathological gamblers are higher than for any of the addictions and second only to suicide attempt rates among individuals with major affective disorder, schizophrenia and a few hereditary disorders (Rosenthal & Fong, 2004).

Addictive Disorders

There is significant overlap between problem gambling and addictive disorders such as alcohol and drug dependence (National Research Council (1999); Stinchfield & Winters, 1996; Crockford & el-Guebaly, 1998; Abbott & Volberg, 2000; Smith, Volberg & Wynne, 1994; Welte et al, 2001; Gerstein et al, 1999). Links between pathological gambling and other psychiatric disorders including substance use, mood, anxiety and personality disorders have also been found even after controlling for sociodemographic and socioeconomic characteristics (Petry, Stinson & Grant, 2005).

iii) Interpersonal/Family Problem Gambling Impacts

Stress and family dysfunction

Families of problem gamblers experience a wide range of difficulties including emotional distress, financial problems and health problems (Dickson et al, 2005). Spouses of problem gamblers often report physical and emotional problems similar to those of the gambler including sleeping problems and a range of stress-related physical problems. Problem gambling can have serious financial and emotional effects on families (Jacobs, 2000). Rates of separation and divorce are significantly higher among problem and pathological gamblers (National Research Council, 1999). Domestic and interpersonal violence have also been identified (see crime section above).

iv) Vocational/Workplace Problem Gambling Impacts

In addition to work related crime, numerous job-related impacts have been associated with problem gambling including; irritability, moodiness and poor concentration at work, lowered efficiency, impaired judgment and faulty decision-making, gambling on company time, lateness and absences, and abuse of the telephone to place bets and deal with creditors. The National Research Council (1999: 161) noted that “roughly one-fourth to one-third of gamblers in ... Gamblers Anonymous report the loss of their jobs due to gambling.”

v) Financial Impacts

Along with significantly higher debt, pathological gamblers have been found to have significantly elevated rates of having ever declared bankruptcy compared to non-gamblers (Gerstein et al, 1999). Research on gambling treatment populations found that between 18% and 28% of males and 8% of females had declared bankruptcy (Thompson, Gazel and Rickman 1996; Lesieur and Anderson 1995).

vi) Impacts of the casino environment

More recently, Dickerson, Haw and Shepherd (2003) found that the majority of regular electronic gaming machine (EGM) players lose control over their spending and number of visits on at least some occasions. This suggests that the environment can lead to the occurrence of problems. The 1999 British Prevalence Survey found that 8.7% of players of casino games could be classed as problem gamblers; a higher rate than for other types of gambling. Alternatively, rates of problem gambling in Australia are lower in states where machines are confined to casinos alone (Livingstone et al, 2006).

vii) Limitations in current public health research

Despite recent rapid expansion in availability, few jurisdictions have carried out independent evaluations of the social and/or health impacts of legal gambling. High quality studies include the Australian Productivity Commission (1999), the National Opinion Research Center (NORC) at the University of Chicago on behalf of the U.S. National Gambling Impact Study Commission (Gerstein et al, 1999), a study carried out in Louisiana by a large, multidisciplinary team of researchers at the University of New Orleans (Ryan & Speyrer, 1999), a study commissioned by the Montana Gambling Impact Study Commission and carried out by the University of Montana (Polzin et al, 1998a, 1998b), and two studies that are presently underway in Canada (Williams et al, 2006) and New Zealand (Caswell et al, 2006). To our knowledge, no jurisdiction has ever done more than one socioeconomic impact study. Each of these are country specific and cover a wide range of regulatory contexts and gambling opportunities, some of which are not wholly applicable to the UK context.

In contrast to research on problem gamblers, there is relatively little research on the interpersonal impacts of problem gambling and most of this research is limited to immediate family members.

viii) Linking Impacts to Gambling Problems

A significant challenge in assessing the impacts of the introduction of new gambling in a jurisdiction is how to measure the link between identified impacts and the new gambling operations. Problem gamblers and their family members are often slow to realize and/or reluctant to acknowledge that difficulties they are experiencing are related to their gambling involvement. This underscores the importance of carrying out prospective, longitudinal studies of gambling impacts so that causal inferences are possible. Research also shows that as some people become problem gamblers, others may recover although little is known about this population. It is of crucial importance to policy and service providers that more is understood about the 'flow' of problem gambling: what causes individuals to become problem gamblers and what factors influence their recovery.

ix) Recommendations for Assessing UK Casino Public Health Impacts

In a recent conference presentation, Williams and Stevens (2006) outlined the major methodological issues in conducting impact studies of gambling and some approaches to their resolution:

- The importance of casting a wide net to capture and report all potential economic and social variables that may be affected;
- While classical cost-benefit analysis can be used to examine clearly quantifiable impacts, other impacts are best quantified in ways that best capture the impact so that the end result may be several different indices;
- Socioeconomic analyses should examine the geographic 'magnitude' of the impact and estimate both community-specific and wider, regional impacts;
- There is a need to document gambling opportunities and socioeconomic effects prior to the opening of a new gambling venue as well as for several years after;
- To address difficulties isolating the effects of gambling, they recommend using both pre-post *and* matched control designs;
- It is important to over-sample subpopulations most at risk so that these subpopulation impacts can be examined adequately;
- It is essential to qualify the results of impact studies as specific to the type of gambling introduced, the jurisdiction where it is introduced and the time period in which it is introduced.

d) Cultural and Community Impacts

Large gambling developments can have profound effects on the communities in which they are situated, both negative and positive. While potential benefits of casino development include enhanced community services, infrastructure (transport and roads) and new employment opportunities, casino development can also lead to deterioration in personal and social values and in community and public spaces, to changes in provision of social and cultural services and to reductions in public safety and community satisfaction.

There is a dearth of research on **community and cultural life impacts** associated with the introduction of new forms of gambling. If we take “socio-cultural” more broadly to mean the distribution and patterning of gambling participation among population subgroups as well as attitudes and opinions about gambling, the social epidemiological literature becomes more relevant. Most epidemiological surveys of gambling and problem gambling that have been carried out internationally include detailed questions about gambling participation and many such studies also include questions about attitudes towards gambling in general or toward specific gambling activities. These studies have been reported over several decades and come from many different countries (Abbott & Cramer, 1993; Amey, 2001; Azmier, 2000; Economopoulos, 2006; Gallup, 1999; Kallick et al, 1976; Kwan, 2004; Peltzer & Thole, 2000; Volberg, Toce & Gerstein, 1999; Sproston et al., 2000; Creigh-Tyte & Lepper, 2004)

Social capital and quality of life are also related to the **community and cultural impacts** of legalised gambling. Such studies have become more common in Western countries and social capital studies are now underway in Australia, New Zealand and Britain (Office for National Statistics General Household Survey) as well as the US. We identified one recent study of the relationship between casino gambling and social capital in the US (Griswold & Nichols, 2006). Analyzing data from surveys conducted in 1978, 1988 and 1998, these researchers found that the presence of casino gambling within 15 miles of a community significantly reduces social capital and should be a consideration in policy decisions.

i) Limitations of research on cultural impacts

As McGowan et al (2000) note in their critical review of the socio-cultural literature on gambling, this literature is dominated by quantitative research. A further criticism is that culture within gambling studies tends towards interpretations of the exotic particularly certain ethnic or cultural groups (Cassidy, CCLM 30/11/06). Representation from anthropology and other non-positivist social science disciplines is limited as are qualitative forms of research such as participant observation and content or discourse analysis that might better reflect cultural interests. McGowan et al (2000) recommend that future studies incorporate prospective and longitudinal research designs. They further recommend that the socio-cultural methodological repertoire be broadened to include qualitative, phenomenological research as well as new epistemologies. Such work will better situate gambling research in the contemporary social sciences.

ii) Considerations for UK Casino Community and Cultural Life Measurement

In our view, the best available approach to assessing **community and cultural life impacts** from the Gambling Act casinos in Britain is a prospective, longitudinal study that assesses gambling participation, attitudes toward gambling, assessments of the impact of casinos on the community, assessments of quality of life and social capital. Additional community based impact studies drawing on integrated health impact assessment methodologies can also contribute data from a community perspective. Areas in need of regeneration already collect a substantial amount of data using community health and social indicators which could be oriented towards a focus on casinos in relevant areas.

1.3 Methodological Options

It is anticipated that changes introduced by the Gambling Act 2005 could lead to significant growth of the gambling industry. The research team believes that it is important that research developed to monitor and measure the impacts of growth be sufficiently powerful to be commensurate with the size of that growth. The selected research option should be appropriately robust, comprehensive and consistent and ideally measure change over the period of major growth. A number of possible options have been evaluated;

Option 1: Reliance on existing surveys and already planned exercises such as the 2007 Prevalence study and its successors

A limited amount of baseline impact data can be obtained from the 1999/2000 (Sproston et al, 2000) and 2007 British Gambling Prevalence Survey. However, this survey primarily focuses on gambling behaviour and the prevalence of problem gambling at a single point in time across the general population. For the purpose of assessing the impacts of the Gambling Act, 2005, casinos these data have a number of limitations. Firstly, it is very difficult to ensure that sufficient numbers are obtained in sub-samples of interest, both geographically and/or by demographic group (sex, age, and ethnicity). The 1999/2000 survey had a sample of 7,680, of whom less than 1% were problem gamblers. Only 4% were past year gamblers in casinos and, thus, the numbers of casino problem gamblers (estimated at 8% of this sub-group) amounts to approximately 25 people, making any further sub-group analysis invalid. Even if, in the forthcoming study, the sample size is increased to 10,000 the equivalent figure only increases to 32. Secondly, assessment of public health, crime and community and cultural life impacts is necessarily restricted to measures of problem gambling prevalence (e.g. whether an individual has committed a crime as a result of gambling). This cannot give robust data on even the most basic crime and public health data such as the types of crime committed, any data on the victims of the crime and measures of their impact, whether the crime was reported or prosecuted (all of which contribute to the assessment of the costs of gambling related crime), the nature and extent of physical and/or mental health problems attributed to gambling, or the nature and extent of immediate spouse/partner, child, family and community impacts (including violence) (all of which contribute to an assessment of the costs of gambling related health impacts).

Additional available research into mental health could be of similar limited use, as would be research undertaken by the Scottish Executive. In addition, local councils may undertake research into gambling development in their areas to facilitate the planning and licensing processes. However, this option is not comprehensive or consistent and the information will necessarily be fragmented and patchy and will not allow causal attribution or understanding of local variation.

Existing prevalence studies can identify the development of some new markets where these are from comparatively large social groups. For example, changes in participation among women can be identified at two points in time. Existing studies do not, however, have sufficiently large samples to allow the identification of the development of markets in relatively small social groups such as ethnic minorities, nor could they identify the impacts of the new markets geographically or economically.

In relation to children and young people the National Lottery Commission prevalence study may be repeated given that study has now been replicated three times since first study in 1997. This could serve as a useful source of data on general (child) population changes in gambling behaviour and it would not currently be possible to link these in any way to the development of casinos.

The most important limitation of this approach is that existing studies were not designed to capture the changes introduced by the Gambling Act 2005 and assess social impact. Such research will not provide a picture of the new casinos or identify or track changes consequent upon their development. In particular, these studies do not provide relevant information concerning the impacts of the new regional casino or identify its geographic market area.

The Gambling Act 2005 will allow the establishment of up to 17 new casinos. However, changes are also likely from further licence applications received under the previous Act. Existing studies will not distinguish these or have the power to differentiate between varying consequences.

Summary of Benefits and Limitations of Option 1

Advantages of Option one are that it:

- Does not require new research
- Does not need a comprehensive research framework
- Does not involve management of consistent standards across studies or across time.
- Does not involve additional costs

Disadvantages of Option one are that it will not:-

- Identify all relevant impacts
- Measure change over time
- Differentiate impacts on different host communities
- Allow changes to be attributed to the Gambling Act 2005 casinos (including the regional casino)
- Allow measurement of the impacts of emerging machine and gaming technologies within the casinos (particularly the introduction of Category A machines and automated table games)
- Allow community engagement and policy makers and gambling providers to take account of community views and,
- Will only provide a fragmented picture of gambling development which cannot be generalised for regulatory purposes

Option 2: Extending the scope of the existing prevalence study and adding regional prevalence studies

Some of the limitations of Option One could be overcome if the scope of the next scheduled prevalence study was increased and a series of regional prevalence studies focusing on the areas granted the new casino licenses was undertaken in conjunction with an analysis of economic data made available through administrative collections.

Such studies would be consistent and designed to be conducted with comparable standards. While the additional ancillary studies would assist in improving geographic coverage it would still not be possible to link impacts, and understand the quality and quantity of impacts, specifically in relation to the new casinos. As with Option 1, impacts would be measured on an individual gambler basis and would only provide an aggregate figure of problem gambling prevalence. There would be no measures of the impacts of problem gambling itself from the national prevalence study although dedicated cross-sectional studies in casino areas could provide limited self-report data on further impacts such as crimes committed, family relationship problems and financial difficulties.

The comparatively long interval between national prevalence studies limits findings to gross estimates of change. Sample sizes would still limit application of findings to larger social groups. Of particular concern is the inability of Options 1 and 2 to identify the progression of gambling careers from being at risk to becoming a pathological problem gambler, particularly for children and young people.

Summary of Benefits and Limitations of Option 2

Advantages of Option 2

- Improved geographical coverage
- Standardised procedures across casino sites
- Limited new field work
- Limited additional cost compared to Option 1

Disadvantages of Option 2

- Identifies individual impacts at a single point of time, but lacks power to show social impacts and causal relationships
- Lacks power to identify flow for at risk groups such as under-aged or youth gamblers and to sufficiently cover sub-populations including older men and women and ethnic minority groups
- Cannot distinguish source and patterns of problem gambling impacts only the 'amount'
- No chronological component, cannot track or monitor impacts of rapidly developing industry
- Increased cost to achieve sufficient sample size to test impacts in casino areas.

Option 3: Longitudinal Study and Local Area Study of the Regional Casino only

Static 'slice of time' studies cannot establish causation. In order to more accurately identify the cause of social phenomena it is better to follow changes over time and to triangulate data from different sources. The research team identified the need for a longitudinal study of gambling behaviour which would both identify a range of impacts and their development. It would follow the same individuals in a sufficient sample over time. Changes in behaviour could be more

validly attributed to specific ‘causal factors’, and in addition a number of important issues concerning both problem gamblers and new markets could be addressed. A longitudinal study would be more powerful if it was combined with an integrated public health community study of the affected area and an analysis of existing local area statistics that could provide a measure of economic impact e.g. property values.

Option 3 would apply this trio of studies to the geographic market area of the new regional casino and a matched control area only. This would entail additional costs for field work and research co-ordination but these would be limited in geographic extent.

The specificity of Option 3 limits the additional cost but means that important variations in impact between different host communities will be missed. For example, the effects of the regional casino maybe dependant partly on drawing custom to the area in which it is located from communities at a considerable distance. Such tourism impacts on its local community may, therefore, be more likely to encourage regeneration or investment in tourist infrastructure than in a casino where the customer base was primarily within its own community. The issue of whether casinos generate ‘new’ money or redirect income away from existing facilities is of considerable importance to local authorities and in estimating gambling’s potential contribution to regeneration nationally.

Summary of Benefits and Limitations of Option 3

Advantages of Option 3

- Comprehensive package of studies integrates information for one region
- Comprehensive identification of impacts in the regional casino area
- Avoids issues of consistency in research application
- Geographically focused management project
- Monitors change over time in the regional casino area
- Establishes cause and effects links between policy change and social outcomes for the regional casino

Disadvantages of Option 3

- Cannot detect important regional variations in impacts in different host communities
- Cannot detect importance of casino size in determining impacts
- Limited ability to inform policy concerning the workings of any aspect of the Act other than the regional casino
- Extra cost

Option 4: Longitudinal Study and Local Area Study of Regional Casino, 4 large and 4 small casinos

Option 4 is designed to provide a comprehensive and consistent study of the impacts of the Gambling Act 2005 casinos while overcoming the limitations of Option 3 focusing on a single area. Option 4 selects the regional casino, a representative sample of four large and four small

casinos which are also established by the Act along with matched controls for each area. This sample size is felt by the research team to be sufficiently large to allow generalisability and therefore to provide an appropriate monitoring tool.

A package of studies designed in this way gives an appropriate before and after assessment of casino impact and take adequate account of variations in host community and casino size as optional variables. The addition of large and small casinos allows for impacts according to size and a variety of locations to be assessed.

The longitudinal component of this proposed study is sufficient to identify risk and a full range of potential impacts with a high degree of reliability. These longitudinal studies would need to be linked to an intercept study (which links casino patron visiting behaviour, travel patterns, accounts of spending on different gaming activities, youth/parent/carer gambling attitudes and behaviour in adjacent areas to the Gambling Act casinos), an integrated public health community study of the affected area, a displacement study and an analysis's of existing local area statistics that could provide a measure of economic impact e.g. property values. This package of studies contributes to a comprehensive measure of economic, public health, crime and community life impacts and enables triangulation of data. This, along with the inclusion of matched controls places conclusions about cause and effect within a strong evidence base. In addition, we consider it is important to obtain an independent measure of the relationship between crime and casino development at a national level to take account of reported and unreported crime and also crime that is exported out of the casino areas.

Summary of Benefits and Limitations of Option 4

Advantages of Option 4

- Comprehensive package of studies integrates information for a representative sample of geographical areas
- Comprehensive identification of impacts for regional, large and small casinos
- Avoids issues of consistency in research application
- Monitors change over time in relation to regional, large and small casinos
- Evidence based approach to causal relationships between policy change and social outcomes

Disadvantages of Option 4

- Cannot detect important regional variations in impacts in remaining 8 host communities
- Considerable cost

Option 5 Longitudinal Study and Local Area Studies of Regional Casino, 8 large and 8 small casinos

Option 5 applies the same comprehensive package of studies to all 17 of the new 2005 Act casinos. It overcomes a key disadvantage of option 4, namely that of gathering robust data which allows for the detection of regional variations in impacts in the remaining 8 host communities. It

is ground breaking internationally and its extensive longitudinal scope and sample size address issues which have been compromised in more limited studies. No agency has yet attempted a full social and economic study of the gambling industry especially at a time when it is undergoing considerable growth.

This series of studies would definitively identify new and developing markets and detect variations in region and host with accuracy. By examining the entire new market over time it would provide a comprehensive picture of the impacts of the Gambling Act 2005.

The studies would incur very considerable costs in overall management/co-ordination and in implementation. It is doubtful that this additional cost yields a sufficient increment in information over Option 4.

Summary of Benefits and Limitations of Option 5

Advantages of Option 5

- Comprehensive
- Identifies all impacts and has power to attribute causality
- Large statistical sample gives power to identify small at risk groups including youths in a longitudinal sample
- Links impacts specifically to casino development or otherwise.

Disadvantages of Option 5

- Higher implementation costs than Option 4

Option 6: Extending the Framework to Measure Impacts outside Casinos

There are a number of provisions in the Gambling Act, 2005, that relate to the licensing, distribution and structural characteristics of gaming machines. The impact of the resulting regulations on such matters as note acceptors, software, location and licensing will require careful monitoring. It is widely believed that gaming machines are associated with greater loss of control and that loss of control is a central feature of problem gambling. Several studies (Abbott & Volberg, 1999; Fisher & Griffiths, 1995; Griffiths, 1999; Australian Productivity Commission, 1999) claim that problem gambling is linked to increased access to electronic gaming machines for both adults and children and young people (NLC, Griffiths & Wood, 2006). A meta-review (Dowling et al, 2005) proposes this evidence is inconclusive and debates continue, most recently in the UK with the British Medical Association who maintain that as the Gambling Act 2005 comes into force this will encourage the spread of EGMS and that problem gambling may increase (BMA, 2007, p7). Furthermore, although there may be some distal impacts for children and young people following the introduction of the new casinos, particularly secondary impacts of problem gambling on families, crime and cultural change, the primary proximal impacts for young people are also thought most likely to result from continued access to machine gambling outside casinos. Whilst the Act actually aims to regulate the situation and number of machines both inside and outside casinos (and may result in a reduction of EGMs outside casinos) it will be

important to monitor the situation and impact of new machines in the UK to ensure public confidence bearing in mind both methods and design will require careful development (BMA, 2007).

It is estimated that there are over 2,000 Internet gambling sites currently available online, with approximately 0.9 million users in the UK alone (RSe Consulting, 2006). As encryption technology and the security of financial transactions improve, internet gambling will continue to increase. Internet gambling has a wide range of potential impacts. These include negative impacts on consumer interests (e.g. services conducted in an unfair manner), on individual gamblers and their families (largely viewed as resulting from a potential increase in problem gambling resulting from greater accessibility, both in time, such as during short breaks from work or family activities; and in space, such as from home and from the workplace), and on the scope for criminal activities such as money laundering (Clarke et al., 1998).

Whilst there are clearly concerns about the potential for underage gambling on the Internet (see for example, BMA, 2007) there is not sufficient evidence to fully gauge the nature and extent of the problem in the UK. Evidence from the US suggests that Internet gambling in youth may be reducing (Annenberg Public Policy Centre, 2006). However, Moodie and Finnigan (2006) found that of their sample of youth from two Scottish regions (N=1,980) 15% gambled on the internet and the NLC study on 12-15 year olds reported 8% using 'any other gambling e.g. gambling on line' in England and Wales (NLC, Griffiths & Wood, 2006). This is, therefore, a situation which requires careful monitoring.

The NLC youth study currently covers machine gambling, scratchcards and use of national lottery and other lottery products by young people. In order to obtain basic time limited data on the impacts of new gambling opportunities for youth two changes are proposed; the introduction of specific questions on Internet gambling, and distinguishing between legal and illegal machine gaming.

In order to measure impacts of machines outside casinos for both youth and adults, a machine tracking pilot is proposed. In addition it will be important to monitor changes in the general population of both Internet, machine gambling (particularly FOBTs) and also casino expansion brought about by new '1968 Act' applications it is proposed that a module be added to the UK Household Longitudinal Survey. This longitudinal data adheres to the principles of the framework, enabling more meaningful causal relationships to be established over time, and would provide important supplementary data to the main longitudinal study measuring casino impact.

Summary of Benefits and Limitations of Option 6

Advantages of Option 6

- Time specific coverage of impacts on youth
- Identifies impacts of machine and internet gambling outside casinos and has power to attribute causality for adults
- Allows for clear distinction to be made between impacts linked specifically to casino development and to other forms of gambling

- Provides data on the feasibility of extending machine player behaviour tracking methodologies and could inform regulatory decision making for machine gambling.

Disadvantages of Option 6

- Higher implementation costs than Option 1-5
- Does not include longitudinal design for youth

Option 7: Adding a longitudinal youth study to the framework

A key area of concern for both the public and policy makers is the vulnerability of children and young people in relation to gambling. Longitudinal data is lacking in the UK which could provide evidence of the nature of early gambling behaviour and understanding of how this behaviour may lead to problem gambling behaviour in late adolescence or early adulthood. With additional funding, a module could be incorporated into the *Longitudinal Study of Young People in England* (LSYPE), also known as *Next Steps*, commissioned by the Department for Education and Skills (DfES) to continue providing baseline prevalence data and allow for assessment of changing trends with legislative change. As with adults, there is a need to identify behavioural, risk and protective factors in relation to problem gambling and other addictive behaviours which can be done most reliably through a longitudinal design. Such a study could also identify statistical relationships with other problematic behaviours such as youth crime, drug and alcohol use, school exclusion and anti-social behaviour. It could also probe the relationship between video gaming machine play, computer game playing and the excessive use of gaming machines.

Summary of Benefits and Limitations of Option 7

Advantages of Option 7

- Comprehensive coverage of impacts on youth and has more power to attribute causality

Disadvantages of Option 7

- Higher implementation costs than Option 6

Conclusion

Gambling generates both costs and benefits. Hence, a key question for both regulators and communities across the world has been whether the costs of gambling outweigh the benefits. A comprehensive impact assessment would consistently address: what the costs are, who bears them, who should pay for them and how they can be minimized, what the benefits are, who gains, and how gains can be maximized? How these costs and gains should be shared are the rightful concerns of many stakeholders including gamblers, their families, communities and regions, tax payers, gambling and related businesses, health, social care and criminal justice providers; in short the citizens of the UK and their government.

A range of potential impacts have been identified through a review of research in other jurisdictions, notably, Australia, New Zealand, Canada and the US. These countries continue to develop their gambling impact assessment evidence base as different forms of gambling opportunities emerge in a rapidly changing industry. Their regulatory frameworks, populations and cultures, and gambling environments share both similarities and differences and research from these countries is not straightforwardly applicable to the UK. We can, however, learn from it and have recommended seven options for further consideration, identifying the advantages and disadvantages of each.

TABLE 1: 7 OPTIONS FOR THE IMPACT ASSESSMENT FRAMEWORK

Research option	Compre-hensive/ Consistent	Crime Impacts	Economic Impacts	Public Health Impacts	Culture and Community Impacts	Impacts of gambling outside casinos – youth, machine and Internet gambling	Comments
Option One - Existing prevalence studies	Does not cover all new casino areas	Only whether crime committed	Consumer Surplus adjusted for national prevalence of problem gambling in casinos No other economic impacts	Problem Gambling Prevalence	Not addressed	Problem Gambling Prevalence Expenditure Extent and medium of play	Only shows effects at one point in time Cannot show change over time for the same individuals (flow) or social impacts Not able to establish ‘cause’
Option Two – Regional prevalence studies with widened scope for next national prevalence study	Could cover new casino areas	Only whether crime committed	Consumer Surplus adjusted for national & regional prevalence of problem gambling in casinos No other economic impacts	Problem Gambling Prevalence	Not addressed	Problem Gambling Prevalence Expenditure Extent and medium of play	Only shows effects at one point in time Cannot show change over time for the same individuals (flow) or social impacts Not able to establish ‘cause’

Research option	Comprehensive/ Consistent	Crime Impacts	Economic Impacts	Public Health Impacts	Culture and Community Impacts	Impacts of gambling outside casinos – youth, machine and Internet gambling	Comments
Option Three – Longitudinal study limited to regional casino area	Limited to region	Addresses those linked to individual behaviour	Addresses those linked to individual behaviour	Addresses those linked to individual behaviour	Addresses those linked to individual behaviour	Coverage linked to gambling behaviour and children of individuals in sample area.	Limited to one area, will not show regional or size variation
Option Four – longitudinal studies, intercept, crime, displacement, local area community, health and economic impacts studies of regional casino, sample of 4 large and 4 small casinos and 4 areas affected by recent casino applications with matched controls	Restricted by area sampling	Comprehensive coverage in sample areas	Comprehensive coverage in sample areas	Comprehensive coverage in sample areas	Comprehensive coverage in sample areas	Coverage linked to gambling behaviour and children of individuals in sample areas and integrated health impact data collection (i.e. agency data and local areas statistics)	Will assess crime economic impacts, public health and culture life impacts, able to track changes and accurately identify problem gambling across the life cycle.

Research option	Comprehensive/ Consistent	Crime Impacts	Economic Impacts	Public Health Impacts	Culture and Community Impacts	Impacts outside casinos – youth, machine and Internet gambling	Comments
Option five – similar range of studies as Option 4 but applied to all new 2005 casinos	Comprehensive coverage	Comprehensive coverage	Comprehensive coverage	Comprehensive coverage	Comprehensive coverage	Coverage linked to gambling behaviour and children of individuals in sample areas and local areas statistics	More comprehensive version of 4 above, close identification of all regional changes
Option six – Addition to any of options 1-5 a) machine player tracking pilot, b) extension of NLC youth study, c) displacement study d) Additional module on UKHLS to any of options 1-5	Improves coverage in options 1-3	Improves coverage in options 1-3	a &d) More accurate measure of contribution of problem gambling to consumer surplus b) Youth Problem Gambling Prevalence c) Displacement	Improves coverage in options 1-3	Improves coverage in options 1-3	Developing new methodologies to measure the impact of machines outside casinos Monitoring youth gambling (not youth)	Youth prevalence study only shows effects at one point in time Cannot show change over time for the same individuals (flow) Not able to establish 'cause' Part of option 6 or 7
Option Seven – similar range of studies as Option 6 with addition of longitudinal youth study	Comprehensive coverage (youth)	Comprehensive coverage (youth)	Comprehensive coverage (youth)	Comprehensive coverage (youth)	Comprehensive coverage (youth)	Comprehensive coverage (youth)	More comprehensive version of Option 6 enabling 'flow' and causality to be established

CHAPTER 2: BACKGROUND AND METHOD

2.1 Gambling Impact Measurement in the UK

To date, there has been almost no research on the impacts of legal, commercial gambling in Great Britain. An early report by Brown and Fisher (1996) for the Home Office and a recent report for the Scottish Executive (Reith & ScotCen, 2006) are the only UK-specific studies that we were able to locate. The report by Brown and Fisher was intended to inform the debate surrounding deregulation of gambling in Britain by examining the experience of other countries in regulating the casino industry. The Scottish report, conducted a decade later, was also largely a review of research in other countries and came to the following conclusions:

- The evidence base on the impacts of gambling for the U.K. is ‘extremely thin and much of the available material is methodologically weak and open to interpretation’;
- The amount of research that has been conducted with sample sizes sufficient to robustly identify problem gambling impacts is limited;
- Research that tracks changes over an adequate amount of time is also limited. The study recommends that ‘the impacts of casinos need to be monitored through longitudinal surveys of a range of social and economic factors, with findings tested against control groups’;
- There is confusion in the literature between prevalence (the rate of a condition in a population at a single point in time) and incidence (the rate of new occurrences of a condition in a population). Incidence data are most pertinent to measuring impacts and are best gathered through longitudinal cohort studies (Abbott and Volberg, 1999).
- There is a lack of research on the impacts of gambling on specific social groups and the relationship between impacts and wider socio-economic organisation, particularly socio-economic deprivation;
- The issue of causality remains unresolved; whether gambling causes the impacts identified in the international literature, contributes to them or is caused by them;
- ‘The evidence base shows that casinos are neither as economically beneficial as supporters claim, nor as socially damaging as opponents fear’;
- Travel to casinos may be an important factor in determining impact according to research in the US that finds the majority of visitors travelled more than 50 miles to the largest casinos but that smaller casinos draw their customers from the local areas in which they are situated;
- Prevention and treatment strategies are an important factor in mediating casino impacts. For example, in New Zealand where a public health approach has been integrated into the development of new gambling opportunities problem gambling has declined (Abbott and Volberg, 2000);

- Predicted visitor numbers: Small casinos expect approximately 500 visitors per day, large 1,500-2,000 and Regional casinos around 4,000 – 5,000 (Pion Economics 2005);
- It is difficult to compare the UK situation with that in other countries as the culture of casino gambling has been quite different. ‘The quite considerable differences that exist between British and international casinos may mean that the findings from one do not map onto the other in straightforward ways. However, as the U.K. moves towards the model existing elsewhere international research is of increasing relevance’ (Reith & ScotCen, 2006, p79).

2.2 Scoping Study Aims and Objectives

The scoping study aims to show how social and economic researchers, local authorities and other stakeholders can best identify the social and economic effects of the 17 Gambling Act Casinos. Of particular interest are:

- Social and economic effects on the local area and region in which the casinos are located as well as on the wider society,
- Consequences for the overall gambling environment locally, regionally and nationally and
- Any resulting change for the cultural life of Great Britain.

The study aims to identify the optimum impact model for identifying, measuring and reporting on each of these aspects in terms of immediate and medium term effects of the new casinos. It has the following main objectives:

a) To advise on the most appropriate methods of identifying a range of possible social and economic effects of the 17 Gambling Act Casinos.

The list of factors to be explored in the impact assessment studies to be recommended include:

- Changes in gambling behaviour, particularly problem gambling and youth gambling;
- Any associated changes in alcohol, and other substance dependency;
- Social harms arising such as increased family violence, homelessness, crime, bankruptcy, etc;
- Whether or not attitudes to gambling and other activities are affected;
- Effects on social cohesion, participation and life chances;
- The effectiveness of interventions which reduce harms and increase benefits of Gambling Act Casinos;
- Changes to incomes, employment and investment trends net of any diversion from other parts of the economy;
- Changes in expenditure on other forms of gambling and other forms of consumption expenditure;
- Effects on other industries such as tourism and the horse industry; and
- Whether or not these effects are confined to particular segments of the population or particular locations within Great Britain.

- Any other benefits (health, social, economic, community or otherwise) of the Casinos development (not incurred as a result of intervention and not covered by the changes mentioned above).

b) An assessment is made against the following criteria:

- Number of studies required;
- Data requirements;
- Likely overall accuracy that can be attained together with any biases that may be involved,
- Speed with which results can be produced,
- Costs likely to be incurred, and
- Management resources required to ensure the continuity and consistency necessary to obtain comparability of results across all casinos.

Where possible we have also commented on:

- The likely costs of impact assessment;
- How the different aspects of impact assessment can most economically be applied in the context of existing data collection requirements on local authorities and community organisations (such as health);
- Degree of reliance on the co-operation of different stakeholders for data collection and the extent to which compliance or non-compliance will alter study design;

c) To make recommendations about the most suitable method or methods to be adopted, the scope of any sample-based or other data collections, the preferred timing of research, the optimal number of studies and the most appropriate management structure for the project.

d) To identify the skills that are required to perform the recommended programme of study and how best to encourage the development or enhancement of those skills.

e) To identify the limits of applicability of each method or combination of methods identified with particular regard to regional and national policy on gambling and commercial gaming. In the case of the recommended method or methods a careful analysis is made of the degree to which it would be appropriate to draw general conclusions.

2.3 Scoping Study Method

A consortium was established comprised of academics drawn from different disciplines and areas of expertise including direct involvement with national gambling socio-economic impact studies in other countries (US, New Zealand, South Africa and Japan).

For heuristic purposes the project was structured into four modules:

- Crime impact
- Economic impact
- Public Health impact
- Community and Cultural Life impact

Each module followed the same methodology. Initially all relevant literature was scoped, read wherever possible, summarised and entered into a database. This literature informed the writing of short summary reports which identified:

- The main methods and study designs employed to measure gambling impacts
- The main impacts identified
- Summary of learning from the literature for the UK context
- Recommendations for a framework to study the impacts of the Gambling Act 2005 casinos

Consortium agreement was reached on inclusion and exclusion criteria for each module area, databases to be interrogated and search criteria during week 1 (21-22 August, 2006) and agreed with DCMS.

Exclusion criteria: Over 15 years old

Search criteria:

Impact AND

Gambling/Casino/gaming machines/Bingo/Betting/Leisure/Tourism/Entertainment

Assess* AND

Health/Crime/Community/Culture

Cost* AND

Gambling/Casino/Gaming machines

Benefit* AND

Gambling/Casino/Gaming machines

Impact Module inclusion criteria: Studies that contain information relevant to the measurement of crime, economic, public health or community and cultural life impact, at least one search term found in abstract.

A systematic search using the agreed criteria on the standard data bases was conducted (see Figure 1);

Figure 1: Databases for Evaluation Review

ABI/INFORM Global	Google Scholar
Academic Search Premier	Medline
ASSIA	NICE
Business Source Premier	PsycArticles
CESSDA	PsycInfo
Cochrane Library	ScienceDirect
Dissertation Abstracts	Social SciSearch
ESRC Society Today	Web of Science

A manual check of references was also undertaken in selected papers to identify items unlikely to be contained in the data base search.

Materials selected for retrieval and for eventual inclusion in the review included primary and secondary research studies, policy documents and other 'grey literature' texts containing the agreed key words.

Materials retrieved were cross checked by email with the relevant consortium members for the module to establish where hard copies needed to be obtained and sent to consortium members. Electronic links were provided where these were available.

Four virtual workshops were then conducted involving international researchers and policy experts with experience in the specific module areas. Participants were all supplied with the relevant database and workshop briefings or reports prior to the discussion. The Crime impact module workshop was conducted through three separate, smaller discussions, owing to the difficulty of combining participants from time zones in 3 world regions. A list of workshop participants can be found at Appendix 1.

CHAPTER 3: SUMMARY OF METHODOLOGICAL CONSIDERATIONS FOR MEASURING THE IMPACTS OF CASINOS

3.1 Crime Impact Assessment

The Gaming Act (1968) was introduced primarily as a means of removing crime from gambling, and the establishment of the Gaming Board of Great Britain led to the development of a well-regulated industry. The recent popularity and availability of Internet gambling has led to a resurrection of fears that excessive gambling leads to crime with some high-profile cases of theft from employers leading to lengthy prison sentences and in one case the bankruptcy of the company whose money was stolen (Guardian, Wednesday September 13 2006; Guardian, Wednesday August 2 2006; Guardian Unlimited, Friday March 10 2006). The opening of a range of new and larger casinos that will present a wider range of people with easy access to high-prize Electronic Gaming Machines (EGMs) has led to the expression of fears that crime will increase in the immediate vicinity of the new facilities. These fears have been exacerbated by reports from Australia and New Zealand—where gambling on EGMs and Video Lottery Terminals (VLTs) has already been liberalized—of ‘pokie’ disease and its associated social problems that include a rise in some types of crime (Australian Productivity Commission, 1999).

3.1.1 Crime Impacts Identified in the Summary Review

Problem gamblers in professional treatment and in self-help admit to a wide variety of illegal activities to obtain money to gamble or to pay gambling-related debts. These crimes are most often non-violent and include passing bad checks, shop lifting, check forgery, thefts from employers, tax evasion and tax fraud, loan fraud, embezzlement, larceny, bookmaking, hustling, fencing stolen goods and burglary (Lesieur, 1998). A survey of Gamblers Anonymous members in Montana found that 69% of the respondents had bounced checks to get money to gamble or pay gambling-related debts, and 73% admitted committing one or more illegal acts (Polzin et al, 1998a). Many problem gamblers entering treatment have significant legal problems and there is evidence that numerous individuals already incarcerated have problems related to their gambling (Abbott & McKenna, 2005; Abbott, McKenna & Giles, 2005).

Problem gamblers in the community also have higher rates of arrest and incarceration than others in the population. The US national impact study found that one-third of problem and pathological gamblers had ever been arrested compared with 10% of low-risk gamblers and 4% of nongamblers. Similarly, 21% of pathological gamblers and 10% of problem gamblers had ever spent time in jail or prison compared with 4% of low-risk gamblers (Gerstein et al, 1999).

Although most crimes committed by problem gamblers are believed to be non-violent, an analysis of links between gambling and crime conducted for the Montana Gambling Study Commission showed that burglary, larceny-theft, robbery, vandalism, driving under the influence and weapons offences were positively correlated with per capita tax revenues from EGMs throughout Montana. These relationships remained even after other factors were statistically controlled (Polzin et al, 1998a). Five areas of crime impacts have been identified from the international literature:

i) 'In-house' crime within casinos; Whilst the obvious linkage between crime and the traditional mainstream gaming industry is well reported (e.g. defrauding of bookmakers) there is very little coverage and almost no research on crime within the casino setting. In the USA such cases are dealt with by casino security and, although there is a feeling that the prevalence is fairly high, figures do not have to be reported to external agencies. It may not be in the interest of a casino for any problems with criminal behaviour taking place inside a casino to be reported on in the wider community. However, there is clearly potential for employees to use their insider knowledge for financial gain and for customers to attempt to gain advantage through nefarious means (i.e. cheating and hacking technology, see for example <http://news.bbc.co.uk/1/hi/england/london/6263795.stm>). As was the case in the US in the 1970s (Commission on the Review of the National Policy Toward Gambling, 1976) the problem of organised crime and casinos was the primary impetus for the British Gaming Act (1968) and organised crime remains as a focus for research (McMillen & Woolley, 2000; McMullan & Perrier, 2003; Finckenauer & Chin, 2004). In a similar vein there is the potential for loan-sharking on the casino floor. The likelihood of aggression from customers both to staff and to other patrons of the casino facilities should also not be under-estimated.

ii) Crime committed in order to acquire funds to gamble or pay off gambling debts; Several studies have explored the link between gambling and crime by examining the motivations for committing gambling related offences including fraud, larceny, robbery and stealing (Centre for Gambling Research, 2003). Crofts (2003) found that in all such offences between 1995 and 1999 (N=63) in New South Wales, Australia, 78% were gambling related. In one New Zealand study, half of the male prisoners in the study classified as probable pathological gamblers admitted to committing gambling related offences (Abbott, McKenna & Giles, 2005). Female prison populations are less researched. Two studies have been found which suggest that between a quarter and a third of female prisoners are probable pathological problem gamblers (Lesieur, 1993 (Canada); Abbott & McKenna, 2005 (New Zealand)). Similarly, there are connections between gambling and offending behaviour with a significant proportion of these women (approximately half) also admitting to committing crimes to fund their gambling (Abbott & McKenna, 2005). In relation to casinos, investigations of white collar crime have not found convincing supportive evidence for increases in embezzlement, fraud or forgery in the US (Albanese, 1999). However, other studies suggest that most gambling related crime remains unreported so that studies relying on reported crime may underestimate such impacts (see for example, Abbott & McKenna, 2005). Studies on white collar crime and gambling more generally (not specific to casinos) similarly find high rates of gambling related crime in prison or crime conviction populations. In relation to serious fraud prosecutions between 1998 and 1999 in Australia, for example, Sakurai and Smith (2003) find that 14.7% of offenders were motivated by gambling. They note that the most common offences committed by those who were motivated by gambling were obtaining finance or credit by deception and cheque fraud and that 86% of the gambling related offenders spent the proceeds of the crime on gambling.

iii) Crime as a by-product of gambling behaviour; Crimes under consideration here are matters such as family violence, sexual assault, child neglect, drug and alcohol related offences (Balci & Ayranci, 2005; Darbyshire et al, 2001; Griffiths et al, 2005; Griffiths, 2004; Hegarty et al, 2000; Muelleman et al, 2002; Tran, 1999; Courtney, 2002). However, the links are not straightforward or necessarily causal (see for example, Suissa, 2005). A Thai study found that gambling and alcohol use were closely related to violence against children

(Isaranurug et al, 2001) and there is a considerable literature on the possible links between gambling, alcohol and substance misuse but this tends to be clinical literature focused on the issue of co-morbidity rather than crime (see for example, Hoyle, 2000; Shaffer, et al, 2004). One study carried out in Montana found a relationship between spending on electronic gaming machines—measured using county tax revenues—and two specific categories of crime including weapons offences and drunk driving (Polzin et al, 1998a).

iv) Gambling as part of the social milieu of the illegal world; The explanation explored here is a psychological analysis which proposes that gambling and crime enjoy an indirect but reciprocal relationship. The postulation is that the effects of crime on gambling and vice versa are bi-directional, constituting 'overlapping lifestyles'; thus gambling and crime are joined by commonalities in the lifestyles that support both activities. The theory is that the primary motivating factor behind the development of a gambling or criminal lifestyle is an existential fear and the ability of individuals to deal with and adapt to change. Each time fears are mastered, the individual's adaptive resources are reinforced and such adaptation is the antithesis of a gambling or criminal lifestyle based on hedonism and short term expectancies as adaptation emphasises self-control and the balance of expectations. It is the individual's distance from the gambling or criminal ideal rather than the conformity to the stereotypical roles of such lifestyles which defines that person's commitment to a gambling or criminal lifestyle. This distance is subject to constant change due to the dynamic nature of human behaviour. Consequently, within the theory, there is no direct causal link between gambling and crime but merely an 'interactive nexus' (see for example, Piscitelli & Albanese, 2000).

v) Crime impacts arising from the arrival of a casino; Several studies have examined the crime impacts of casinos in general terms (Buck et al, 1991; Chang, 1996; US General Accounting Office, 2000; Nuffield & Hann, 2000; Gazel et al, 2001; Nichols et al, 2002; Evans & Topoleski, 2002; DCPC Parliament Victoria, 2002; Stitt et al, 2003; Ortiz & Corcoran, 2004; Phipps, 2004; Baxandall & Sacerdote, 2005; Grinols & Mustard, 2006). The literature is contradictory, depending on the method used, particularly whether increases in visitor numbers, changes in policing and impact assessment over time are included in the study design. A problem noted in many research studies is the inability to attribute crime directly to casino developments because of the way in which crime data is recorded. All such studies focus on reported crime. Similar difficulties exist with studies of suicide (see for example, Nichols et al, 2004). Perhaps it is more appropriate here to consider the issue of deviant or antisocial behaviour rather than crime (although in the case of criminal damage and some by-laws it may be a criminal offence). Litter, noise, nuisance and small scale disorder are difficult elements to measure.

The Crime Impact Module (CIM) participants noted the following impacts observed from their experience:

- Crime displacement: Areas in need of regeneration may also be areas with relatively high crime levels. When casinos are situated in such areas, it is necessary to consider whether their impact is to reduce crime and/or displace it to other areas in the locality.
- The deterrent effect of high standard venues, through, for example increased surveillance and safe design.

- The ‘fit’ between the casino and community is an important variable in impact measurement. Different communities—even within a relatively small geographical location—may feel different impacts. Impact assessment should relate to ‘natural community boundaries’ that can be marked by many things (e.g. a dual carriageway or railway, PCT services, schools, mosques, temples and churches).
- Impacts will vary over time. Large and small casinos may show decline over time as the ‘novelty factor’ wears off. Initially patronage may increase, over time patronage plateaus, drops and casinos alter to regain business. Large and small casinos may have capital problems and a ‘short run view’. Negative social impacts, including crime, may therefore be greater in large/small casino areas.

Although the analysis in the literature is inconclusive regarding the impact of casinos on crime, the absence of clear-cut findings is itself important. It is possible that the effects of casinos on a community are quite varied depending on a multitude of variables which are dependent on local conditions that are not easily generalisable or replicable from community to community. Real communities are complex, and many variables are needed to describe the character of a community more precisely – key factors might be population size, local economy, unemployment rates, demographic profile and also more esoteric variables that capture a community’s history and culture.

3.1.2 Summary of Gambling Crime Impact Design

Within the studies examined a variety of populations are sampled, using a variety of methods summarised in Figure 2.

Figure 2: Summary of Gambling Crime Impact Design

Samples	Methods	Design
Clinical (problem gambling, hospital)	Survey (Telephone, Face to Face, CAPI)	Single study
Community	Literature Reviews	Time series
Prison (adult and youth offending)	Focus Groups	Longitudinal Panel Studies
Helpline callers	Observations	Pre-post Casino
Self selected through advertisement	Case study	
Children (schools/of problem gamblers)	File analysis	
Judicial cases	Interviews	
Crimes reported	Statistical analysis of crime data	
Arrests		

The notion that gambling and crime can be correlated is contentious. To a large extent, the divide is one which derives from disagreement on how crime should be measured (an issue not unique to gambling related crime). The following shortcomings have been cited in the literature:

- Difficulty of researching aspects with ‘soft evidence’ e.g. unreported crime, organised crime

- Difficulties associated with secondary analysis of existing datasets not designed to record gambling related crime;
- Need for research amongst hard-to-reach social groups;
- Research on crime committed within the casino setting almost non-existent;
- Lack of longitudinal research which allows incidence of casino related crime to be recorded and also tracks changes over sufficient time periods;
- Need for more qualitative research.

3.1.3 UK Gambling and Crime Measurement Considerations

One key feature of many papers surveyed for this project was a lack of a clear theoretical framework that encompassed sufficient aspects of crime (reported and unreported) and that also encompassed variables (such as time, population change, community characteristics) known to impact on crime rates. Grinols and Mustard (2006) establish some theoretical links between crime and casinos in the US using a method which compares crime rates across 3165 US casino and non-casino counties over 19 years. There are also some persuasive economic models such as the long-established Becker Theoretical Framework - this is an economic model of crime impact that can be generated as a mathematical formula (cost-benefit) used by Gazel, Rickman & Thompson (2001). However, these studies look at reported crime available from policing/criminal justice data sets. Studies which examine the relationship between specific criminal behaviour and gambling tend to be focused on clinical or prison populations. There is no single comprehensive study, possibly because of the cost implications, that includes; sufficient time to monitor change pre-post casino, accounts for population variables and measures both reported and unreported crime specifically linked to gambling.

In the last 25 years in the UK (as elsewhere) there has been a dramatic expansion in the numbers of people engaged in crime related data collection. A significant growth in the research capacity at the UK government Home Office coupled with the growth of criminology in universities has meant a wide variety of data sources have been created and exploited including:

i) Police recorded crime, composed of a list of categories outlined in the Home Office Counting Rules, known as ‘notifiable offences.’² The main categories are: violence against the person, sexual offences, robbery, burglary, theft and handling stolen goods, fraud and forgery, criminal damage, drug offences and an ‘other offences’ catch-all that includes offences as diverse as riot and assisting suicide. The NCRS requires that the police record a crime if ‘the circumstances as reported amount to a crime as defined by law and there is no credible evidence to the contrary’. The record will remain unless evidence emerges to disprove that a crime has occurred.

ii) The British Crime Survey (BCS) came about as a result of dissatisfaction with the comprehensiveness of statistics compiled from police records. First conducted in 1981, it has been produced regularly since 2001 by the Home Office, surveying about 40,000 people annually. The main offences covered by the BCS are: vandalism, burglary, vehicle-related thefts (including bicycles), and other household thefts, theft from the person, common assault, wounding and robbery. The BCS is the main source of data on unreported crime in the UK.

² <http://www.homeoffice.gov.uk/rds/countrules.html>

iii) The national databases of offenders (e.g. the Offenders Index) and of offences (e.g. the Homicide Index) along with a host of local record systems maintained by the police, criminal justice agencies and other statutory and voluntary organizations.

iv) Crime and Disorder Reduction Partnerships (CDRPs): Following the Government's recent spending review and the publication of the Home Office's 5-year Strategic Plan, the Home Office has outlined 7 new Public Service Agreements (PSAs) that set their priorities to 2007/08.

The new PSA1 aims to give CDRPs more flexibility to decide what their crime reduction priorities should be. PSA1 will be measured nationally using information collected through the British Crime Survey (BCS). Measurement at local (CDRP) level will be through Police recorded crime. In order for these two measures to be aligned, a composite of crimes has been developed called the BCS comparator crime types. These crimes are common to both the BCS and recorded crime. Under the BCS comparator crime groupings, crime can be placed into one of 3 main categories:

1. Acquisitive crime (domestic burglary, theft from a person, theft of a pedal cycle, theft of a motor vehicle, vehicle interference and tampering and robbery).
2. Violent crime (common assault and wounding).
3. Criminal Damage (criminal damage to dwellings, criminal damage to other buildings, criminal damage to vehicles, racially aggravated criminal damage).

v) Other large data sets (many accessible through the ESRC data archive) have been produced, including longitudinal 'cohort' studies, local crime surveys, and self-report surveys. These reflect significant advances in the analytical tools available, such as computer packages for multivariate analysis and statistical modelling and GIS including detailed 'mapping' of the locations of offences and the identification of 'hot-spots', using postcodes or map references.

Thus in the UK, in order to obtain both baseline and monitoring data on crime impact and the new casinos, there are already good sources of data on crime rates that can be extracted at the local level particularly through the BCS.

There may be (as there is elsewhere in the world) a gap in knowledge in the arena of gambling and offending behaviour itself; about how, in the context of gambling and the casino developments specifically, offenders understand and exploit criminal opportunities, about the interactions between offenders, about how they perceive and respond to risk, and indeed about the size and composition of the 'offender population' and 'hidden' offending by people not convicted.

a) Measuring crime inside casinos

One of the most fruitful proposals for strengthening the control of crime within the casinos, which acknowledges both sides of the debate, are those developed by Braithwaite on the basis of his research into the successes and failures of regulation in very different industries and businesses. Using Braithwaite's (1985; 1989) suggestion, businesses such as casinos could be obliged by government to write a set of rules tailored to the unique contingencies of their operation. These rules could be submitted for comment and amendment to interest groups, including citizen groups. Firms should have their own internal compliance unit with statutory

responsibility on the director to report cases of violation, and the function of government inspectors would be to audit and if necessary sanction the performance of this unit.

CIM participants noted that the co-operation of the operators was crucial in this area. They also emphasised the importance of taking account of different policing relationships between the casino's own security squad and community policing. It was agreed that a regulatory incentive was required if money laundering was to be measured and that it would not be possible to measure this impact without such an incentive (Brodie, Hancock CIM 8/11/06). The way in which links between community policing and casino security are working could be monitored through the Integrated Impact Assessment, measured through the number of referrals to police, or the extent of police activity (time, police resources utilised) occurring in direct response to casino security.

b) Measuring crime committed in order to acquire funds to gamble or pay off gambling debts

Where offending patterns change or emerge, the data can be interrogated in such a way as to investigate such changes. The Offenders Index (OI) holds criminal history data for offenders convicted of standard list1 offences. At any time data held on the Index is 6 to 9 months in arrears. The data is derived from the Court Appearances system and is updated quarterly. The Index was created purely for research and statistical analysis. Its sole purpose is to provide full criminal history data on selected samples of offenders. The Offenders Index system uses SSA-NAME matching software which has been adapted to the needs of the Index. The aim of matching and merging is to produce complete and as accurate data as possible relating to the offenders in the study. The new software automatically matches and assigns a computer-generated (and unique) OI number to a study offender with a record on the database if the surname, initials, date of birth and gender all correspond *precisely*. A score is given to all possible matches and users are required to consider those above or below thresholds which are set according to the nature of the study. Users are able to deal with possible duplicate offenders as they arise and are required to 'merge' as they work through the study. Merging takes place when it is apparent that an offender has been entered on the database twice or more and it is necessary to reconcile the criminal histories by merging to produce a complete record. Users may insert information in these fields for their own benefit, for example to assist in identifying records, or to assist the matching/merging process. The end result of a study is an output file consisting of a set of full criminal histories for each of the offenders under scrutiny (except for any who could not be traced on the Index or identified with reasonable certainty).

Such offenders could then be contacted with a view to complete a self report survey and/or be asked to be interviewed regarding their motivations, reasoning and links, if any, to gambling behaviour, location of crimes and casinos. Interviewing would present the possibility for 'snowballing'³ in order to contact unconvicted offenders.

³ **Snowball sampling** is a non-probability method used when the desired sample characteristic is relatively rare, making it difficult or cost prohibitive to locate a sufficient sample size of respondents through probability methods. Snowball sampling relies on referrals from identifiable subjects to generate additional subjects. Whilst snowballing reduces the likelihood that the sample will be representative it provides the opportunity to collect data from hidden/sensitive populations in which prevalence and the nature and extent of the problem is unclear as is the case in gambling related crime.

c) Measuring crime as a by-product of gambling behaviour

The same methodology could be adopted as with a) and b) but the nature of the crimes means it is less likely that the offender will appear in the system. Access to evidence (if any) would be better obtained by contacting victims or adding a short gambling specific module to the BCS. Alternatively, a scoping and mapping exercise of organisations such as Women's Aid (and other domestic violence NGOs) and drug and alcohol services could be undertaken in the relevant casino area, followed by some qualitative (and indeed quantitative) work which could be undertaken to ascertain the gambling related circumstances surrounding the individuals concerned. This could form part of an integrated health impact assessment.

d) Measuring crime as an impact of the arrival of a casino

Neighbourhood policing has evolved significantly as a means of tackling crime and the perceptions of crime over the last few years. Between 2003 and 2005, a number of evaluations took place of the National Reassurance Policing Programme at national (Tuffin et al, 2006) and local levels (Pearson, Simmill-Binning & Paylor, 2005). The NRPP looked at the impact of working with communities to address the issues that they perceived to be at the root of their local problems.

The idea developed from collaborative work between Surrey Police and the University of Surrey, drawing on the 'signal crimes' perspective developed by Martin Innes (Innes & Fielding, 2002). Since the end of the programme, the NRPP had developed into a number of different schemes with police forces across the country. At the heart of each scheme is a meeting between community police and residents at which the policing priorities for that area are set by local people. A good example of this is the Police and Communities Together (PACT) in Lancashire where over a thousand neighbourhoods are engaged through specialist teams comprised of: Community Beat Managers, Police Community Support Officers (PCSOs), Special Constables, response officers, community volunteers, Road Policing officers, and other groups, such as Neighbourhood Watch Schemes.

'PACT encourages local communities to get involved in local police activity, helping to set policing priorities in their areas and to contribute to the policing of their neighbourhood. This allows communities to tell the police and other partner agencies exactly what is of concern to them and how they would like to see these issues dealt with. These concerns are highlighted through PACT meetings, door knocks and street meetings.' (Lancashire Police at <http://www.lancashire.police.uk/index.php?id=1155>)

PACTs do not deal just with direct policing matters but along with their partners, such as the local authorities, issues such as litter, shabby bus shelters and concerns over noise can be tackled along with anti-social behavior, a lack of facilities and concerns about young people.

Utilising these forums to monitor the impact of the casino generally but specifically to examine these low level 'crimes' would be an extremely cost effective way of proceeding. Such an approach would also meet recommendations made by one workshop participant (Brodie, Australia), namely adopting a methodology that will enable communities to answer the following questions:

- Does the casino make my community more safe/less safe and in what respect?
- Does it concentrate crime to the extent that police resources must be redeployed?
- What is the casino's restorative capacity? Has a space been created where crime is merely displaced?

Several participants in the CIM workshop noted the importance of the extent to which police and other criminal justice professionals can be persuaded to consistently collect data specific to monitoring casino impact. A community based approach such as PACT may help with this if combined with a quality control or monitoring system to ensure data is being collected as planned. They also reinforced the value of socio-spatial mapping techniques such as GIS (see McMillen & Doran, 2006) particularly in relation to mapping what the intended casino spaces are currently used for (who frequents them, when, how etc) as baseline data which would be particularly helpful in measuring crime displacement (Brodie, McMillen).

3.2 Economic Impact Assessment

Any evaluation of economic (and other) impact from the 17 Gambling Act casinos should be conducted within the 'best practice' framework of analysis set out in HM Treasury's Green Book (HM Treasury, 2003). This substantial document recognises that similar issues arise in appraising costs and benefits of policies across all fields in which government may make policy interventions. To ensure consistency in decision taking, it provides guidance on valuation issues commonly encountered not just in ex ante appraisal but also in "retrospective evaluation of a policy programme at its completion" (Green Book, p.6), which is the context here. Supplementary guidance particular to policies with a strong spatial focus, where impacts are anticipated (as in the case of the 17 Gambling Act casinos) on regeneration, renewal and regional development (the 3Rs), is available in the document 'Assessing the Impact of Spatial Interventions' (<http://www.communities.gov.uk/documents/citiesandregions/pdf/156906>). Similarly, the DCMS White Book (Daffern and Mehdzadeh, 2004) applies the general principles of the Green Book to the context of programmes with important heritage or cultural impacts.

Our recommended programme for impact assessment of new casinos has been checked for consistency with best practice approaches as set out in these official manuals for policy evaluation. It is important that detailed decisions on implementation should similarly conform to the principles embodied in these documents when the research programme is under way.

3.2.1 Economic Impacts Identified in the Summary Review

We take as starting point the classic article by Eadington (1999). Reviewing the rapid expansion of casino gaming in the United States in the 1980s and 1990s, Eadington distinguished three areas of benefit or gain from permitting new facilities:

i) Benefits to users: Those who enjoy the entertainment provided by a casino and who therefore increase their levels of utility when they choose to allocate some of their budgets to the new good. Consumer surplus is the economist's conceptualisation of the net benefit users will obtain and this should be measured and included in any assessment of impact on aggregate social welfare.

The emphasis on liberalisation of gambling as a means to the ends of raising revenue for government (or good causes) and promoting economic development has meant that few studies in the area have sought to measure benefits to players. For example, the literature on state lotteries focuses on whether take-out rates are set at levels consistent with revenue maximisation and it is only Farrell and Walker (1999) who have quantified consumer surplus and illustrated the substantial extent to which benefit is lowered by the 'good causes' tax. Their findings imply that the potential size of consumer surplus is such that ignoring it in policy determination could lead to significant loss in potential aggregate welfare.

The same is likely to be true of casino style gaming. In the most comprehensive of government investigation of the costs and benefits of gambling, the Australian Productivity Commission (1999), while careful in its assessment of negative social impacts, nevertheless reported very high estimates of consumer benefits for non-problem (recreational) players, for example in the range of (AU)\$1.4bn – (AU)\$2.3bn (fiscal year 1997-8) in the case of electronic gaming machines. Similarly, theses at the University of Nevada, Reno and the University of Salford, by Marx (2002) and Crane (2006) respectively, forecast consumer surplus from new casinos in Britain to dominate even pessimistic estimates of social costs from problem gambling. It therefore appears that measurement of actual consumer surplus once the casinos are operating should be a central strand in the monitoring of the consequences of the Gambling Act.

ii) Ancillary economic benefits from casino development: Regeneration of run-down areas, job creation in locations with high structural unemployment and improvement in the economic status of disadvantaged groups are often cited as reasons for casino development. For example: casinos in New Orleans and Detroit were intended to revitalise blighted downtown areas; facilities in isolated communities in South Dakota and Colorado had the goal of mopping up unemployment associated with the decline of the mining industry; and casinos on tribal lands were expected to ameliorate the plight of native Americans. To the extent that the siting of the 17 new casinos in Britain is driven by similar considerations, success in achieving the hoped for benefits should be assessed in any review of impact on aggregate social welfare.

iii) National and local government benefits: Governments may gain from permitting new casinos, which will be limited in number and may therefore be capable of generating economic rents. National government will gain from ongoing taxation of gross gaming revenue while local authorities in host communities are likely to be able to capture future monopoly profits when operators compete for the licence in an auction based either on overt payment of money or on willingness to invest in local facilities. Benefits here may vary widely across the new casinos, not just because of predictable factors such as market size and the proportion of tourists and locals in the customer base, but also because authorities may not all be equally adept at negotiating favourable payoffs from operators in terms of facilities that will have a lasting effect on local welfare.

iv) Impacts are not independent of each other: These classes of benefit, which the programme of work we recommend will be designed to quantify, are not to be regarded as independent of each other. For example, if a large casino development were to be hosted by an isolated community with indicators of social deprivation, local impact may be high (as spending would come primarily from tourists) but consumer surplus would be constrained by high travel costs to access the facility. On the other hand, a similar development in the core of

a conurbation may serve a relatively local market; there will then be limited impact on the city's overall level of economic activity, because much spending would merely be displaced from other leisure services, but the gain in consumer surplus would be likely to be relatively high.

v) Negative impacts (costs): The principal negative consequences of casino developments may include increased incidence of problem gambling, increases in criminal activity and degradation of the environment (whether direct or indirect through extra travel generated by trips to geographically isolated facilities). Methodology for monitoring some of these impacts is proposed in other sections of this report but the economics section includes discussion of which costs should be counted and how they can be measured in terms of money.

3.2.2 UK Casino Economic Impact Measurement Considerations

i) Measuring consumer surplus

Emphasis on consumer surplus would be regarded as normal in most policy areas, for example transport. But does the concept transfer well to the gambling sector? Consumer surplus is the aggregation of the difference between what each user would be willing to pay for the service and what he or she actually pays. This is positive for the great majority of consumers since price is set to attract the marginal participant in the market, leaving infra marginal consumers with a net benefit from the fact that they value the service more than it costs them to procure. With a known or estimated demand curve, the sum of these benefits across consumers is easily calculated.

However, that benefit is measured with respect to a self evaluation, the willingness to pay (a proxy for expected utility) of each individual consumer. And use of that self evaluation is legitimate only if it is based on rational, informed spending decisions. It is hard to object to Farrell and Walker's estimate of consumer surplus from the lotto game because compulsive behaviour appears rare amongst lottery players (except in countries such as China where it is the only legal gambling medium) and it can be presumed, as readily as in fields such as transport, that individuals know best what serves their own interests and where they can gain utility. However, casino gaming is associated with a higher incidence of problem or pathological behaviour than the lottery and, while the majority of *individuals* in casinos are fully in control of their decision taking, a large proportion of *spending* may be accounted for by problem gamblers. Demand curves are the basis for calculation of consumer surplus but, if their position and shape are driven by the decisions of those who appear irrational and self-harming, the resulting estimates lose legitimacy.

The Report of the Australian Productivity Commission (1999) confronted the problem with detailed argument. Its approach yields a range of estimates depending on whether the problem is ignored (all players assumed rational) or whether spending of problem gamblers is removed from the demand curve (apparent consumer surplus of problem gamblers set aside) or whether spending of problem gamblers is treated more subtly (the Report's adjusted consumer surplus figure assumes problem gamblers gain consumer surplus up to the level of play of median players but generate negative surplus for themselves beyond this point).

Consumer surplus should be measured for the new British casinos similarly since there is no literature post dating the Australian report that can be regarded as having refined the

methodological discussion and approach. Calculation of consumer surplus according to the simplest assumption (all players rational) is straightforward.

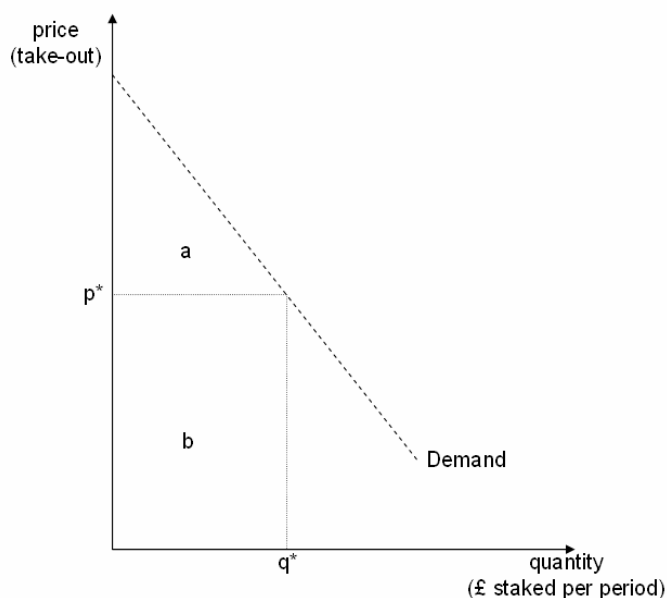


Figure 3: Global Consumer Surplus

Consider Figure 3. Price and quantity are measured on the vertical and horizontal axes respectively, with price given by the take-out rate (inclusive of any taxes) and quantity by the number of pounds staked per period. If observed take-out is p^* and observed handle is q^* , the value of consumer surplus is then area a while b represents gross gaming revenue (GGR), i.e. player losses.

Of course, the position and shape of the demand curve is unknown except that the area b is readily ascertainable as it is likely to have to be declared to the regulatory authority. So long as the demand curve is assumed linear, the area a (consumer surplus) is given by:

$$\text{Consumer surplus} = 0.5 \text{GGR} / |\varepsilon|$$

Where ε is elasticity of demand with respect to take-out.

The only obstacle to measurement of the consumer surplus is therefore that a view has to be taken on the value of demand elasticity: the more elastic demand is assumed to be at current take-out, the lower will be the amount of consumer surplus per period.

The APC Report tabulated estimates of demand elasticity from a number of econometric studies of the markets for various gambling services (and an updated survey is available in Paton, Siegel & Vaughan Williams, 2003). In nearly every study, demand has been evaluated as elastic but the APC found it “difficult to believe” that this reflects reality. However, its reasoning is spurious, for example its claim that there is little substitutability between different forms of gambling has been decisively rejected in more recent empirical work. In fact, there is every reason to believe an assumption of elastic demand will be appropriate in the case of the Gambling Act casinos as the strict limitation on their number implies a degree of monopoly power which casinos will be able to exploit by pushing price (take-out) up into the elastic section of the demand curve. This will apply particularly in the case of the regional

casino which will be the only one in the country offering its particular range of gaming and other leisure facilities.

It will be up to researchers at the time of investigations (during the post-assessment period of 2010 and beyond⁴) to justify assumptions concerning demand elasticity in light of conditions in the industry and findings from contemporary demand analysis. It is likely that, as in the Australian case (where the Commission worked with elasticities between -0.3 and -1.3), any future study would present consumer surplus estimates for a number of different alternative assumptions concerning the value of elasticity.

The low data requirements make it appropriate that an estimate of this ‘global consumer surplus’ be made for all 17 Gambling Act casinos. The amount of benefit indicated may be very high: Crane (2006), on the basis of inevitably speculative (though informed) assumptions about how much revenue the new casinos will secure, forecast global consumer surplus from new machine gaming in UK casinos as over £4.5bn. per year (with elasticity set at -1.3).

An equivalent figure, calculated on the basis of actual GGRs once the casinos are open, would be defensible as a summary indicator of social benefit to the extent that consumption of even addictive goods may be portrayed as rational within the well known framework offered by Becker’s Rational Addiction Model. However, this would be controversial and it would be safer to compare only the consumer surplus associated with non-problem- or ‘recreational’-gaming with any figure calculated for social costs generated by the new casinos.

Fig 4 illustrates the approach to calculation of consumer surplus advocated by the APC. The demand curve is disaggregated into two sectors comprised of recreational and compulsive players.

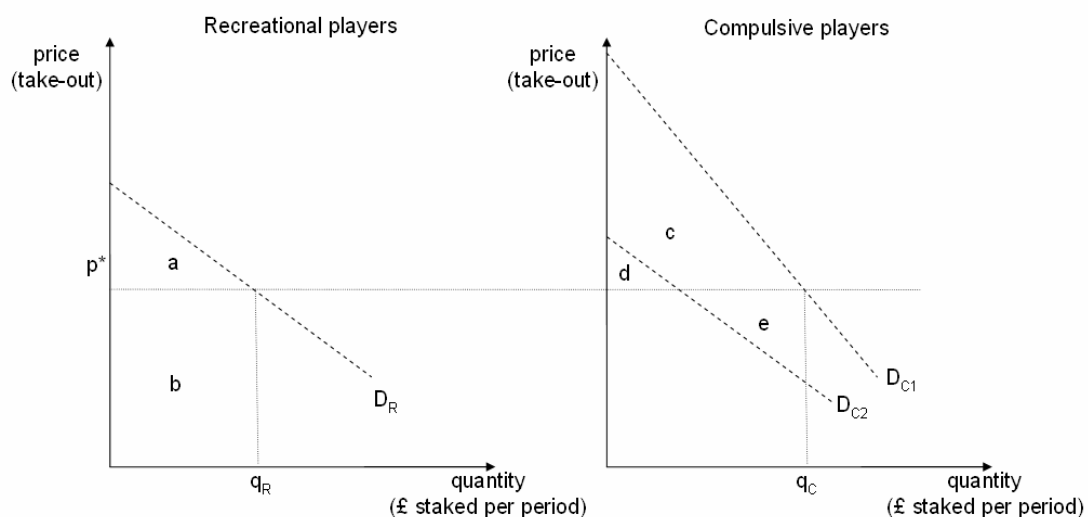


Figure 4: Consumer Surplus of Non-compulsive and Compulsive Players

⁴ Working on the basis of the planned timetable prior to subsequent amendments

In the left panel, a is consumer surplus for non-compulsive players and is a component in the amount of global consumer surplus calculated as above. Evaluation of a requires an estimate of gross gaming revenue contributed by recreational gamblers (b) and an assumption concerning the demand elasticity for this sub-group of players.

In the right panel, there are two demand curves. D_{c1} is the demand curve for compulsive players ($c+d$ is their evident consumer surplus but this is an illegitimate measure of benefit because their compulsion leads them to 'excessive' play). D_{c2} is the demand curve that would characterise this sub-group if they played only to 'reasonable' levels, defined by reference to the level of play of a median player. With respect to this 'legitimate' level of play, the group gains consumer surplus of d . But its actual level of play is higher and this excess play is deemed to generate negative consumer surplus: median players not behaving compulsively would recognise that the enjoyment to be had on these excess gambles was not actually worth the cost incurred. Thus APC represented consumer surplus across all gamblers as $a+d-e$.

There is a certain logic to the Commission's line of reasoning but the division of problem gamblers' play into normal and excess units could be regarded as contrived. In some sense the problem gambler's first plays of the machine in the evening are the product of compulsion as much as those plays made after the Commission's 'median' players have gone home. Following the APC in equating consumer surplus with $a+d-e$ would lead to considerable scepticism of the scientific basis for estimation of consumer surplus.

Our recommendation is for research to focus on a , a measure of the benefit to recreational gamblers from giving them access to the new product represented by the casinos. The qualitative debate on liberalisation of gambling often refers to the need to weigh the benefit to the majority, who play responsibly, against the harm associated with problem gaming. Focus on a will yield empirical estimation of the benefit referred to in this debate.

Of course, informational requirements are much greater than if one were to be content with measuring global consumer surplus. Extensive and careful fieldwork would be necessary to establish the proportion of GGR accounted for by non-problem gamblers and this would need to be carried out at all 17 casinos as the ratio of problem gamblers in the customer base is likely to be very variable across locations. The reliability of any estimates would depend on how appropriate problem gambling screens were to the sample of players surveyed and care would have to be taken not to identify compulsive play with heavy play.

In forecasting recreational players' consumer surplus, Crane (2006) assumed, in line with APC findings for Australia, that 69.7% of GGR in the new UK casinos will come from such players. Combined with assuming demand elasticity of -1.3 and total GGR estimated as before, this yielded her forecast of recreational consumer surplus of £3.2bn per year. The figure is based on a heroic series of projections; but its order of magnitude illustrates the importance of making the effort at estimation once experience of how the new casinos in operation has been obtained.

ii Conceptual objections to measurement of consumer surplus for gambling

Our emphasis on consumer surplus follows from the notion that formation of policy towards gambling is likely to be flawed if no attempt is made to quantify the entertainment value derived by patrons of casinos. Given the practicality of measuring benefit through consumer

surplus, such an emphasis enjoys consensual support from economists at least, with several authorities advocating the use of consumer surplus in this context (Eadington, 1999; Australian Productivity Commission, 1999; Walker and Barnett, 1999). The approach was further endorsed by participants in the Economic Module Workshop.

Nevertheless, objections to use of consumer surplus have been voiced even if measurement, as recommended here, is confined to non-problem gamblers. A very fundamental objection is that 'price' is not in general known to consumers but is a concept imposed by researchers ex post. Masterman-Smith et al. put it thus:

'for most gambling products the 'price' is not known to the buyer and its derivation as an ex post facto concept does not [they imply cannot] help in measuring the consumer's surplus' (Masterman-Smith et al., 2001, p14)

It is of course true that the particular concept of price used by those who have estimated demand curves and consumer surplus is somewhat esoteric. 'Price' for a gambling product is generally defined as the expected loss to a unit stake. Depending on mode of gambling and regulatory rules in different jurisdictions, this may or may not be announced explicitly to consumers. But, can they be presumed to work it out from experience or learn it from informal social networks? It appears not unreasonable to argue that typically they can. The evidence is indirect but consistent. The Swiss Institute of Comparative Law (2006) offers a comprehensive listing of peer-reviewed studies of own and cross-price elasticity of demand for a variety of gambling products in different countries. Virtually all reveal that demand is sensitive to price; for example, work by Thalheimer and Ali (2007) on machine gaming on riverboats and at racinos in the US demonstrates that handle responds more than proportionately to variations in take-out. Even the much greater popularity of roulette in Europe than America may be regarded as testimony to the value consciousness of gamblers (given that the house advantage implicit in the European version of the game is much lower than when the American wheel is employed). Similarly, Eadington and Christenson (2004) shows that casino sales are relatively low in states where high taxes are built into the take-out rate on machines.

This is indirect evidence that at least large numbers of players behave as if they understand price since they respond to researcher-observed price as reliably as in the cases of other goods and services. This appears to legitimise the exercise of basing analysis on the concept of a demand curve and the concept of consumer surplus derived from it.

The most general objection to consumer surplus in the context of gambling is that even 'recreational' gamblers may be irrational. Their choices may not be well informed as consumer theory assumes. Those adopting this critique typically begin by almost defining gambling as irrational. The implication is that gamblers spending money on which they must in the long run lose (as with most gaming machines) must be behaving foolishly. However, this abstracts completely from any pleasure that the gambling process itself imparts. Conlisk (1996) demonstrated that even a risk-averse expected utility maximising (i.e. 'neoclassical') individual would spend a positive amount on gambling so long as a 'tiny' amount of utility was derived from the process of gambling itself. Such utility could come from pleasure in the social setting, daydreaming about winning a fortune or diversion from selecting numbers to play, for example.

It appears untenable to deny that there is entertainment value to some consumers. But, do they spend the ‘right’ amount of money relative to the utility they derive? The question of ‘rationality’ of (recreational) gamblers is without an unambiguous answer. On the one hand, decisions on strategy are demonstrated often to be flawed based on the ‘gambler’s fallacy’, for example⁵. On the other hand, modelling demand for gambling products indicates well defined responses to changes in prices, prices of other products and taxes much as in any other sector of the economy. Of course, the decision on how to play could often be mistaken but the decision on whether and how much to play is still consistent with utility maximisation.

iii) Three further considerations for consumer surplus assessment

(a) Measuring consumer income: Strictly, consumer surplus should be measured with respect to compensated rather than ordinary demand curves. The APC Report makes such an adjustment following Willig (1976). Any adjustment will be trivial so long as the good being analysed accounts for only a small proportion of consumer income. If consumer surplus is calculated only for recreational gamblers, this is likely to be so and correcting for bias associated with using the ‘wrong’ demand curve (i.e. the ‘wrong’ elasticity) is unlikely to be worthwhile. However, if global consumer surplus were being estimated, it would be desirable as the addition of compulsive gamblers is likely to raise mean proportion of income lost in casinos to much higher levels. Making the correction would require acquiring information on player losses relative to their incomes.

(b) Adjustments to tax revenue: Government revenue from taxation levied on take-out is properly considered as an additional benefit of the provision of the new casinos. It represents consumer surplus not already counted that is transferred away from players and made available for the public sector budget. However, where this relates to transactions by compulsive gamblers, consistency requires it to be set aside in the calculations as it then becomes merely a pecuniary transfer (rather than a transfer of surplus) from players to government. Hence, for the purpose of measuring social gains, tax revenue should be adjusted downwards, using the estimate of the proportions of stakes from recreational and problem gamblers.

(c) Incorporating the travel cost method: An alternative route to measurement of consumer surplus is that provided by the travel cost method which uses information on willingness to spend on travel to a recreational facility. A valuable strand of work would be to collect information on trips made to casinos because a factor in location decisions for future casinos should be the extent to which facilities generate extra trips and therefore environmental costs. Data collected for such purposes could then also be used to estimate consumer surplus because willingness to incur travel cost (reflected in the shape and position of a demand curve in travel cost-frequency of trip space, with geographical zone of origin as the unit of observation) should reflect expected consumer surplus from time spent at the casino. Similar adjustments as above would need to be made to ensure that apparent consumer surplus accruing to compulsive gamblers was not included in recreational benefits.

⁵ Note though that work on prediction markets has the consensual finding that bettors in the aggregate spend their stakes in such a way that resulting odds provide highly accurate probabilistic forecasts of future political, sporting and other events.

Travel cost could be measured through the intercept study and should, along with a problem gambling measure, include measures for price paid, willingness to pay and economic well being.

iv) Measuring ancillary benefits and costs

Under this heading, we consider ways in which attempts could be made to identify and assess economic impacts on communities (and adjacent areas) that host Gambling Act casinos. Ex ante impact studies, usually commissioned by interest groups, conventionally claim that large increases in the size of the local economy and in local employment will flow from placing a casino in a particular town or city. Such reports follow the approach of assuming that the casino will generate a certain amount of extra spending in the host community and the effect is then magnified by application of the multiplier.

The validity of this way of forecasting impacts is questionable in terms of both theory and the way in which it has been applied. The theoretical flaws include that such a 'Keynesian' framework can only ever be appropriate to short-term analysis since it abstracts, for example, from population movements induced by development. Practical problems include lack of sufficiently disaggregated input-output data to derive a credible value for the multiplier. Certainly ex ante impact studies have relied on values for the multiplier that appear 'generous' and have also tended to discount the very real possibility that a large proportion of spending in the casino will simply have displaced spending from other local or regional leisure activities (which may in fact be more labour intensive and with an ownership structure that generates less leakage of income out of the community).

In ex post studies it will not be necessary to speculate about linkages between the casino and other sectors nor to measure cannibalisation of leisure spending. If the goal is to bring greater prosperity to a host community, this can be measured directly in terms of changes in a variety of indicators representing economic activity and the level of satisfaction from residing in the town. Of course, the set of local area statistics available to serve as the basis for evaluation may not be ideal for purpose but we judge it will be adequate. By contrast, the way in which National Income statistics are collected in the UK, which is not by geography, makes precise application of a local multiplier approach entirely infeasible.

iv) The costs of gambling

The preceding section focuses on local impacts but now we return to the general question of the identification and measurement of costs and whether it will be possible to estimate an annual monetary sum that can be compared with the consumer surplus of recreational players in the new casinos. Experience in other countries suggests that allowing establishments offering large numbers of electronic gaming machines will prove popular and will increase the size of the UK gambling sector (rather than just cannibalise existing gambling media). There are some indications from other countries that problem gambling may increase, at least in the short term, as a consequence of the introduction of more (and different) machines. For example, the APC Report estimated that up to 10% of users of electronic gaming machines could be classified as problem gamblers and a study in Nova Scotia found that 25% of regular video lottery players acknowledged current or past problems with their VL play (Focal Research, 1998). Both studies have focused on situations where machines exist both inside and outside casinos with those outside casinos causing the greatest increases, thus,

comparisons are not straightforward since new Cat. A UK gambling machines will only be allowed in casinos.

The phenomenon of problem gambling has already influenced how we propose consumer surplus should be measured. We allowed for the possibility that problem gamblers do not gain recreational benefits from decisions to gamble which are made compulsively. Here we refer to something different, the potential of their pathological behaviour to disrupt the lives of themselves and their families, for example through stresses associated with gambling losses that can lead to job loss or marital breakdown. Likewise there will be costs to the rest of the community, for example there will be victims of fraud associated with attempts to finance gambling debt and the Health Service will need to divert resources to treatment of problem gamblers.

v) Consideration of Individual Financial Impacts

Studies of treatment populations have found that pathological gamblers have high levels of debt and declare bankruptcy at higher rates than other types of gamblers (and non-gamblers). Research on gambling treatment populations found that gambling-attributed current debt (as opposed to lifetime borrowing) was \$39,000 in Wisconsin and \$114,000 in Illinois (Thompson, Gazel & Rickman 1996; Lesieur & Anderson 1995). These studies also find that in self-help/treatment populations, between 18% and 28% of males and 8% of females had declared bankruptcy.

However, debt per se is not a unique indicator of gambling problems, since many individuals buy residences, automobiles, and other large purchases on credit. What is unusual is when an individual declares bankruptcy, based on an inability to repay debt when compared to the income of the individual or the household. When bankruptcy occurs, some fraction of the debt may be never repaid, and it is this fraction of debt and borrowing that constitutes a loss to creditors (rather than the magnitude of borrowing or indebtedness). However, in theoretical terms, this loss is considered a transfer and generally is not included in cost benefit estimates.

The US national study of the impacts of gambling found that pathological gamblers had clearly elevated rates of indebtedness, both in an absolute sense and relative to their income. Indebtedness per person was 25% greater among pathological gamblers than among low-risk gamblers and about 120% greater than among non-gamblers. The disparity is even greater when debt is compared to income—pathological gamblers owed (US) \$1.20 for every dollar of annual income while low-risk and non-gamblers only owed \$0.80 and \$0.60, respectively. Along with their higher debt, pathological gamblers had significantly elevated rates of having ever declared bankruptcy: 19% versus 6% and 4% for low-risk and non-gamblers (Gerstein et al, 1999).

The contribution of economics should be to value these social costs. But there is no clear consensus even on which costs should be included in the calculation. In an influential article, Walker and Barnett (1999)⁶ argued that many published estimates of problem gambling were inflated by the inclusion of items that did not belong, according to the principles of classic cost benefit analysis, and that should be ruled out because their presence leads to double counting or they refer to transfers rather than impacts on aggregate welfare. For example, if

⁶ See also Walker's contribution to the Whistler Symposium (Walker, 2000).

problem gamblers and their families gamble away their assets and fall into dependence on social security payments, these represent not social cost but transfers to problem gamblers from taxpayers. If they become bankrupts, creditors lose but the bankrupt has enjoyed the use of these resources and there is no social cost (other than from administration of bankruptcy proceedings). If they turn to theft, amounts stolen are transfers from the victim, not real changes in aggregate wealth (except for loss from using resources in the police and judicial systems to process the crime). These examples illustrate that Walker and Barnett take the narrow view of traditional economics that a social cost occurs only when a transaction between agents imposes a direct cost on a third party, such as a victim of crime committed as a result of gambling losses. The only question for them is whether this cost is 'real' or merely 'pecuniary' (i.e. a transfer). By contrast, their critics would regard as a social cost the discomfort all citizens may feel if gambling adds to the decline in social stability and cohesiveness by pushing up theft and bankruptcy rates. This is a broader but defensible notion of social cost. However, it is less likely, in a liberal society, that one could defend including in social cost discomfort felt as a result merely of others gambling at all.

Most controversial in the Walker and Barnett (1999) critique is their contention that consequences from problem gambling that fall on gamblers themselves should not be counted as costs at all. Our interpretation of the argument is that decisions to gamble are taken in light of a weighing up of the benefits and risks offered by the good. Willingness to pay for, and therefore consumer surplus from, gambling products already reflects potential future costs of the form of, for example job loss or depression. Separate valuation of these 'indicators' would thus lead to the same phenomena being counted twice in any cost benefit analysis. Hence, they maintain that only externalities, not internalities, should be included in *economic* cost benefit analysis⁷.

Problem gambling treatment programmes funded by taxpayers are akin to police costs for motoring accidents. They will not influence consumption decisions and are therefore definitely social costs. But do gamblers who are not currently problem gamblers in fact realise the risks they personally bear with respect to future consequences from the decision to consume? If they do, then the harm to themselves becomes irrelevant to the cost benefit calculus (though the pain caused to their families should still be included as a social impact, or what might be termed a moral cost). Of course, there is no consensus that decisions on gambling are close enough to being fully rational and informed that one should forget about self-inflicted costs altogether; and some would have the instinctive feeling that adverse consequences from gambling are so much less tangible and more distant than those linked to driving that the two cases are not comparable at all.

This difference of opinion on what constitutes social costs is one reason for the huge variation in existing estimates of the money value of problem gambling. The other is that the placing of money values on outcomes (such as divorce, domestic violence or depression) has inevitably

⁷ While Walker and Barnett were making what appeared as a radical intervention in the context of gambling studies, their proposals in fact only echoed earlier mainstream attempts to increase rigour in the application of cost benefit analysis to other fields such as transport. Consider, for example, a proposal to build a faster road that will improve journey times but generate more fatalities. If travellers' gain in consumer surplus can be forecast, there will be no need to account separately for the extra deaths because the willingness of each driver to use the fast route will already be informed by the dangers associated with increased speed and his or her willingness to pay will reflect both the value of time and these risks.

been arbitrary. For example, the APC Report used victim compensation awards from the legal system to value, for example, the cost to a spouse assaulted in a dispute triggered by gambling behaviour. This approach is of course inevitably ad hoc and reflects political decisions in the drawing up of legislation rather than results from scientific research using a revealed or stated preference approach.

As a result of all these conceptual and practical problems, estimates or forecasts of the social costs of gambling are hugely sensitive to subjective decisions of analysts. Above we referred to work by Crane (2006) who estimated consumer surplus to be generated as a result of the provision of new casino facilities in Great Britain. She also made informed guesses of the incidence of problem gambling (and of related negative outcomes) on the basis of what happened in Australian states when electronic gaming machines were introduced. She then shows how the money value of such an increase in problem gambling would vary with how widely social cost was defined and whether one took “high” or “low” estimates of the harm associated with, for example, divorce. Her estimates for the annual social cost vary from £23mn. to £1.75bn., an extraordinary range. If repeated after the casinos open in the light of the actual increased incidence of problem gambling that studies reveal, such analysis will still yield very imprecise estimates since we are pessimistic that the conceptual and practical issues described above can be resolved in the near future.

The Gambling Impact Assessment Framework we recommend will measure a range of social impacts, both positive and negative (see Chapter 6). These cover all the impacts identified in the literature to date and allow for others to emerge through community consultation and data gathering (Integrated Impact Assessment). It will be possible to cost these data using the same kinds of methods adopted elsewhere and in other fields (for example, attempts to cost domestic violence and child maltreatment (WHO, 2000)). A key issue will be attributing causality. This will be partially resolved through the matched control design and the studies which follow up problem gamblers with a measure of self assessment of the link between problem gambling and negative impacts. However, we recommend an attempt to value costs from casinos be made on the understanding that it will indicate only rough orders of magnitude, informed by findings from investigations recommended elsewhere in this report (see Crime, Public Health and Community and Cultural Life sections) but valuation of outcomes identified should be based only on desk work (use of valuations in earlier literature).⁸ In the spirit of Collins and Lapsley (2000), we recommend that separate categories of cost be defined according to whether costs fall on gamblers and their families or on government and other citizens. Given ambiguity over what costs should be evaluated within a broad cost benefit framework, there might then be virtue in asking the narrower question: if we permit casinos in certain locations, what is the money value of the harm inflicted on households who contain no problem gamblers? This would be an interesting figure to compare with consumer surplus to recreational gamblers.

vi) Cannibalisation

The brief for the Scoping Study also invites consideration of the extent to which other sectors within the gambling industry will suffer from the expansion of the casino sector. Prime candidates for cannibalisation include National Lottery products, bookmakers, bingo and

⁸ Our judgement is that fundamental research on valuation of outcomes such as domestic assault or depression is desirable but will be difficult and costly and slow to yield a framework for empirical estimation.

amusement arcades. Of course, loss of revenue by any of these sectors is not a social cost. Rather it signals the opposite as consumers find that reallocation of budgets towards casinos enables them to increase their utility. But cannibalisation may still be of interest to policy makers as losers may include, for example, Good Causes reliant on Lottery funding or the UK horse racing industry, to the extent that it depends on betting.

Studies in the US by Anders and Siegel (1998), Elliott and Navin (2002) and Fink and Rork (2003) all conclude that introducing casinos in a state significantly lowers state lottery revenue. Farrell and Forrest (2005) similarly find that the introduction of keno and of electronic gaming machines in local gaming halls in Australian states both had very strong negative effects on state lottery revenue.⁹ The numbers are high: for example, at the levels of gaming hall turnover reached in some Australian states, permitting machine gaming appears to have lowered sales of on-line lottery games by 20%-30%.

Casino style gaming appears also to pose a threat to horse and dog racing. In the US, casinos have sufficiently damaged existing pari-mutuel betting that many horse racing (and jai alai) venues have had to be authorised to offer large scale machine gaming themselves. Of course, it may be that the cultural strength of horse racing in the UK is stronger than in the US (where on-track betting was often the only legal outlet for the demand for gambling) so that the industry here will prove able more effectively to withstand competition from new style casinos.

⁹ They found no comparable effect from the sector labelled 'casinos' in Australian data (i.e. 'super-casinos' of which there is typically one per state).

3.3 Public Health Impact Assessment

Internationally, there is widespread acceptance that gambling problems are a robust phenomenon that exist in the community and can be measured. Despite general agreement at this fundamental level, there is disagreement about the concepts and measurement of gambling-related problems and impacts. Early conceptualisations of problem gambling were based primarily on clinical experience and consensus among medical professionals. Over the past decade, the discourse surrounding gambling problems has moved from a medical model to a broader public health model.

The medical model focuses on the ill individual; the public health model shifts the focus to the entire spectrum of gambling behaviour and not just on those with difficulties. A public health approach includes consideration of public attitudes towards gambling, public policies on gambling and industry actions in developing and targeting gambling products. A public health approach also includes consideration of the relationship between gambling and general health and well-being.

The subject of the medical approach is the individual while the subject of the public health approach is a population, either the whole population within a particular jurisdiction or subgroups within it. The members of a particular group are assumed to be essentially similar and hence potentially equally at risk. When attention shifts to the group, the faulty mechanism is seen to lie not in the individual but in the arrangements and structures to which they are subject. Attention is focused on common factors linking behaviour to social arrangements. This implies that studies of public health have the following characteristics:

- Population based;
- Concerned with social and economic organisation;
- Multi-factorial and multi-causal;
- Recognise dynamic relationships which change over time;
- Concerned with promoting health as well as treating disease;
- Identify activities or provisions that promote or dissipate problems;
- Identify preventative strategies which minimise harm.

The public health approach will take into account both distal and proximate factors. Distal factors include the background of social inequality which, for example, may make gambling attractive because it provides access to an opportunity which is equally distributed. Proximate factors include such things as ease of access and product technology. Policy can affect both of these types of factor, and so both should be of concern in measuring impacts.

3.3.1 Public Health Impacts Identified in the Summary Review

The basic policy challenge posed by legal gambling is that governments and gambling consumers benefit from the operation and regulation of gambling activities while, at the same time, governments have a duty to protect citizens from the negative effects of the activities from which these benefits are derived. The approach adopted by the UK government has been to seek to achieve as much freedom of action for the citizen as possible while regulating as necessary to prevent rising negative social impacts.

On the ledger's positive side is the value of the recreation that consumers derive from gambling—that is, the fun that ordinary people have playing bingo or blackjack or betting on the horses. These are the benefits to be quantified by measurement of consumer surplus. While there is as yet little empirical support, commentators have pointed out that there is theoretical support for the notion that gambling may also provide important health benefits, such as a sense of connectedness, a change of pace, a respite from social isolation or the demands of everyday life (Korn & Shaffer, 1999). And economists have given extensive consideration to this question, as the preceding discussion of 'consumer surplus' attests. On the other side of the ledger, there are a variety of negative externalities associated with the availability of legal, commercial gambling. While critics cite infrastructure impacts, crime and underage gambling, the 'Achilles heel' of legal gambling remains problem gambling (Eadington, 1999).

Despite recent rapid expansion in availability, few jurisdictions have carried out high-quality, independent evaluations of the social and/or health impacts of legal gambling. To our knowledge, no jurisdiction has ever done more than one socioeconomic impact study. The highest-quality studies that have been carried out include the work of the Australian Productivity Commission (1999), work undertaken by the National Opinion Research Center (NORC) at the University of Chicago on behalf of the U.S. National Gambling Impact Study Commission (Gerstein et al, 1999), a study carried out in Louisiana by a large, multidisciplinary team of researchers at the University of New Orleans (Ryan & Speyrer, 1999), a study commissioned by the Montana Gambling Impact Study Commission and carried out by the University of Montana (Polzin et al, 1998a, 1998b), and two studies that are presently underway in Canada (Williams et al, 2006) and New Zealand (Casswell et al, 2006).

Most of what is known about the impacts of problem gambling comes from studies of people who have sought help for their gambling problems from Gamblers Anonymous or from a professional treatment programme. This approach has been effective in identifying the extent and types of consequences experienced by some problem gamblers, although the National Research Council (1999) points out that the results of these studies must be interpreted with caution because of the small, atypical samples involved. It is also widely recognized that problem gamblers in treatment are not fully representative of problem gamblers in the general population (Abbott & Volberg, 1999; Volberg & Steadman, 1992). While several recent reviews have identified the impacts of problem gambling in a variety of life areas (Abbott & Volberg, 1999; Abbott et al, 2004; National Research Council, 1999; Productivity Commission, 1999), it is worth emphasizing that it is not necessary for an individual to achieve the full-blown psychiatric disorder of pathological gambling to experience problematic impacts from their gambling.

The public health impacts of problem gambling are felt not just by individuals, but also by families, communities and social institutions. Such impacts are usually—if somewhat arbitrarily—divided into five domains. These include the individual or personal domain, the interpersonal domain, the workplace domain, the financial domain and the legal domain.

i) Personal/individual impacts

Problem gambling has a variety of health impacts on the individual, ranging from physical stress reactions to severe psychiatric disorders. Based on individuals in treatment, pathological gamblers are believed to be at heightened risk for a number of stress-related

physical illnesses, including hypertension and heart disease (Lesieur, 1998; Volberg, 2001a). Research has also shown that pathological gamblers are at heightened risk for a variety of psychiatric disorders.

Numerous studies have found high rates of depression and suicidal ideation among problem gamblers in the community as well as among those who have sought treatment (Abbott et al, 2004; Gerstein et al, 1999; Polzin et al, 1998a; Smith, Volberg & Wynne, 1994; Specker et al, 1996; Thompson, Gazel & Rickman, 1996). Several researchers have argued that suicide attempt rates among pathological gamblers are higher than for any of the addictions and second only to suicide attempt rates among individuals with major affective disorder, schizophrenia and a few hereditary disorders (Rosenthal & Fong, 2004).

There is significant overlap between problem gambling and addictive disorders such as alcohol and drug dependence. For example, the National Research Council (1999) noted that individuals admitted to chemical dependence treatment programs were three to six times more likely to be problem gamblers than individuals in the general population. On the other side of the coin, large numbers of individuals who enter treatment for a gambling problem report episodes of alcohol and drug abuse and dependence. A study in Minnesota found that one-third of the clients in the state's problem gambling treatment programs had received prior treatment for chemical dependency and 47% had received prior treatment for a mental health problem (Stinchfield & Winters, 1996).

Community research has also shown that problem gambling is associated with heavy use of alcohol and drugs (Crockford & el-Guebaly, 1998). In studies of problem gamblers in the community in the US, Canada and New Zealand, researchers found that individuals classified as pathological gamblers were significantly more likely than those without gambling problems to be smokers, heavy users of alcohol, and at least occasional users of illicit drugs (Abbott & Volberg, 2000; Smith, Volberg & Wynne, 1994; Welte et al, 2001). The US national impact survey also found that problem gamblers in the general population were significantly more likely than others in the general population to have been alcohol- or drug-dependent at some time in their lives (Gerstein et al, 1999). There are also known correlates with smoking (Shaffer and Korn, 2002). There have been very few published studies to date that have researched the impact of smoking restrictions on gaming venues (such as casinos). In the US, some studies have found that anti-smoking legislation has no significant effect on revenue or profit, although it does lead to environmental improvements relating to the health of casino employees (Surgeon General, 2006; Glantz and Wilson-Loots, 2003). However, other studies contradict this. For example, Pakko (2005) and Thalheimer and Ali (2007) evaluated the impact of smoking restrictions, on slot machine GGR and turnover respectively, in Delaware and found a significant drop in each, and similar findings have been made in Victoria (Forrest, personal communication) and in the UK (see for example, section 4.6 on Bingo below).

Results from the large US National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) confirm earlier findings regarding links between pathological gambling and other psychiatric disorders (Petry, Stinson & Grant, 2005). Pathological gambling in this study was positively and significantly associated with substance use, mood, anxiety and personality disorders even after controlling for socio-demographic and socio-economic characteristics. In a separate analysis of the same data, Morasco et al (2006) found that pathological gambling was significantly associated with a range of adverse physical health problems, including

tachycardia, angina, cirrhosis and liver disease. This analysis also showed that pathological gamblers were significantly more likely than other individuals to have been treated in an emergency room in the past 12 months. These associations remained significant even after controlling for demographic characteristics and a range of behavioural risk factors.

ii) Interpersonal/family impacts

Problem gamblers inflict substantial harm on their families, including spouses, children, parents, siblings, in-laws and other relatives. In contrast to research on problem gamblers, there is relatively little research on the interpersonal impacts of problem gambling and most of this research is limited to immediate family members. In a brief review of the literature, Dickson et al (2005) found evidence that families of problem gamblers experience a wide range of difficulties including emotional distress, financial problems and health problems. In addition to relationship issues, spouses of problem gamblers often report physical and emotional problems similar to those of the gambler. These include sleeping problems and a range of stress-related physical problems.

Several recent surveys have found high rates of physical and verbal abuse among problem gamblers in treatment as well as in the community. A study of family members of problem gamblers in a Canadian treatment program found that 23% of spouses and 17% of children of these gamblers were physically and verbally abused (Bland et al, 1993; Muelleman et al, 2002). Another treatment survey in Montana found that 27% of the problem gamblers in self-help and professional treatment programs in that state reported episodes of gambling-related domestic violence (Polzin et al, 1998a). A population survey in North Dakota found that 92% of the small number of respondents who acknowledged having arguments about gambling that became physical were problem or pathological gamblers (Volberg, 2001b). Rates of separation and divorce are significantly higher among problem and pathological gamblers in treatment and in the community than in the general population (Gerstein et al, 1999; National Research Council, 1999).

Also within the family, there is evidence of a range of problems among the children of pathological gamblers. In addition to the physical abuse of children reported by problem gamblers and their spouses in Gamblers Anonymous and professional treatment programmes, a study of California high school students found that adolescents who reported that one or both parents had a gambling problem also reported higher levels of drug abuse and eating disorders than others in their schools. These youths were also more likely to report an unhappy childhood, to have legal action pending, and to be depressed and suicidal (Jacobs, 2000). In a small qualitative study, Darbyshire et al (2001) found that the children of problem gamblers experience a pervasive sense of emotional and physical loss.

iii) Vocational/workplace impacts

There are numerous job-related health impacts associated with problem gambling. These include irritability, moodiness and poor concentration at work, lowered efficiency, impaired judgment and faulty decision-making, gambling on company time, lateness and absences from work, and abuse of the telephone (and more recently the Internet) to place bets and deal with creditors. A survey of members of Gamblers Anonymous in Wisconsin found that these respondents had lost, on average, more than seven hours of work per month to their gambling (Thompson, Gazel & Rickman, 1996). Problem gamblers borrow money from other

employees to gamble or to pay gambling-related debts and this can affect the morale of their co-workers. The National Research Council (1999: 161) noted that “roughly one-fourth to one-third of gamblers in ... Gamblers Anonymous report the loss of their jobs due to gambling.”

iv) Financial and Legal impacts

Financial and legal impacts are considered important in a public health approach, these are dealt with more thoroughly in the section on economics and crime (p 50). Within the economic cost-benefit analysis it has been shown that financial impacts, such as bankruptcy, are conceptualised as transfers and therefore not costs. Within a public health framework the focus is on the distal and family health impacts of financial loss. In extreme cases, gambling can have devastating financial effects on families, with inability to pay mortgages and utility bills as well as a lack of money for food and basic necessities, and it can contribute to the social exclusion of children, young people and their parents. Such costs are a further example of social (rather than economic costs) that are available for measurement in terms of severity, social and emotional impact, not withstanding their monetary value.

Figure 5 presents information about the main health and public health impacts identified in the several previous national gambling impact studies as well as the impacts proposed for the new study in New Zealand.

Figure 5: Health and Public Health Impacts Identified in Previous Studies

Study	Health Impacts	Broader Impacts Related to Health
GIBS ¹⁰ 1999	Physical health problems Psychological problems	Divorce Job loss Debts and bankruptcy Arrest and incarceration
APC 1999	Depression and suicidality Cost of treatment for a gambling problem.	Debts and bankruptcy Productivity and employment Crime (theft, court cases and incarceration) Personal and family impacts (separation and divorce, loss of household income)
Casswell et al 2006 (New Zealand)	Physical health Mental health	Material well-being (current and future) Housing/accommodation Social connectedness Relationships Perceptions of self Education, training, work Criminal activity

¹⁰ The Gambling Impact and Behavior Study (GIBS) was a research program initiated by the National Opinion Research Center and its partners on behalf of the U.S. National Gambling Impact Study Commission (Gerstein et al, 1999; National Gambling Impact Study Commission, 1999).

3.3.2 UK Casino Public Health Measurement Considerations

In a recent conference presentation, Williams and Stevens (2006) outlined the major methodological issues confronting researchers in conducting impact studies of gambling and outlined some approaches to their resolution. They made the following important points:

- The importance of casting a wide net to capture and report all potential economic and social variables that may be affected;
- While classical cost benefit analysis can be used to examine clearly quantifiable impacts, other impacts are best quantified in ways that best capture the impact so that the end result may be several different indices;
- Socio-economic analyses should examine the geographic ‘magnitude’ of the impact and estimate both community-specific and wider, regional impacts;¹¹
- There is a need to document prior gambling opportunities and socio-economic effects for several years prior to the opening of a new gambling venue as well as for several years after;
- To address difficulties isolating the effects of gambling, they recommend using both pre-post *and* matched control designs;
- It is important to over-sample subpopulations most at risk so that these subpopulation impacts can be examined adequately;
- It is essential to qualify the results of impact studies as specific to the type of gambling introduced, the jurisdiction where it is introduced and the time period in which it is introduced.

i) Assessing public health gambling impacts

The pragmatic demands imposed by the rapid expansion of legalised gambling worldwide have meant that researchers and clinicians continue to seek out or develop relatively brief, easily administered measures to assess the extent and degree of problem gambling in a range of settings. For various reasons, including lack of funding for basic psychometric research as well as the importance of establishing and maintaining comparability over time and across jurisdictions, researchers and clinicians have continued to use only a few tools to serve sometimes disparate purposes (Thomas et al, 2003).

The various problem gambling measures that have been developed internationally reflect prevailing conceptualisations of problem gambling. It has been claimed that some new measures (such as the Victorian Gambling Screen and the Canadian Problem Gambling Index) reflect a public health rather than a mental disorder perspective and assess harm rather than individual psychopathology. However this is more evident in rhetoric than reality. While the content of these measures differ somewhat, many of the items are taken from earlier measures and are behaviourally focussed. Furthermore, the degree of correlation between them is such that an impartial observer would conclude that they are measuring essentially the same thing (Abbott & Volberg, 2006).

As Gerstein et al (1999) have pointed out, impact studies of gambling are generally limited to those impacts that can be assigned an economic value and do not include *all* of the impacts that might be important to an individual, family, or community. This is because many of the human burdens of problem gambling are not readily quantifiable. For example, the cost of

¹¹ Williams and Stevens (2006) suggest using patronage origin as a guide to how large a geographic region to study.

legal fees in a divorce does not begin to capture all of the social and psychological pain of divorce for the partners and families directly involved. A further limitation is that efforts are rarely made to assess the impacts of problem gambling experienced by individuals who do not meet the established cut off levels for problem or pathological gambling.

In terms of scoping casino impact from a public health perspective, the host is only one aspect of the wider framework which also includes the agent and the environment (see Figure 6). The agent represents the specific gambling activities in which players engage and the environment encompasses both the microenvironment of the gambling venue and the host's wider environment including family, community and the socio-economic, cultural, and political context.

Figure 6: Summary of Public Health Framework for Impact Assessment

Host: Individual gambler	Agent: Gambling Activities	Environment
Demographic (age, gender, ethnicity, socio-economic group, disability) Mental health and psychiatric condition Co-morbidity (drugs/alcohol/other addictions) Attitudes Biography Relationships Financial status	Type of activity (lotteries, slot machines, casino table games, bingo, horse or dog race betting, e-gambling) Characteristics of agent; (type of machine, features to encourage/discourage play)	Microenvironment of the gambling venue (staff training on prevention of problems, access to information/advice, gaming area design, security) Wider environment: family (debt, family violence or relationship problems), community (under age problem gambling levels, community cohesion and quality of life, alcohol and drug problems, crime, suicide, divorce, poverty and deprivation index criteria), cultural and political context (how is gambling socially sanctioned, promoted/advertised?)

ii) Linking impacts to gambling problems

A significant challenge facing researchers in assessing the impacts of the introduction of new gambling in a jurisdiction is how to link identified impacts to the experience of gambling problems. At the most fundamental level, problem gamblers and their family members are often slow to realize and/or reluctant to acknowledge that difficulties they are experiencing are related to their gambling involvement. Without specific training and incentives, people working in the helping professions, community agencies and law enforcement are unlikely to ask people whether their difficulties are linked to gambling involvement or to a gambling problem. This underscores the importance of carrying out prospective, longitudinal studies of gambling impacts so that causal inferences are possible and the desirability of including a small number of items assessing gambling involvement in intake interviews with people seeking help for a range of problems.

In addition to studies such as these, a further option is to monitor the impacts of new machines in the casinos. Data is already held by casinos which routinely record all electronic interactions and conducts detailed visual surveillance of customers on the gaming floor (Lambrecht & Bernd, 2004; Nickell, 2002). This data is integral to both their security systems and marketing strategies and is stored electronically. It is, therefore, theoretically possible to make it available at minimal additional cost to regulatory authorities and researchers. Since it is already collected there is no additional cost to the casino in making it available. There are a number of issues, however, in terms of ethics, accountability and public involvement.

International casinos also routinely record all activity of tables, machines and players. Machine activity is typically monitored online through an intranet. Cameras ensure that the whole casino is wired for sound as well as sight. Casinos store this data partly for marketing, such as identifying high rollers and their preferences, and partly as part of their security to identify collusion and other fraudulent patterns of play.

This mass of data therefore already exists but jurisdictions vary in the degree to which they are required to hand it to regulators or make it available for research. There is however no reason why it should not be available for research. At the present time a study based on this data would require voluntary agreements with industry partners to access the data. One immediate challenge we foresee with voluntary agreements is that if one casino provides the data and others do not, biases may be introduced into the analysis. This can be avoided by making data provision a licence condition.

In line with Livingstone (2006) we suggest data collection should include;

- Expenditure per specific EGM game/platform per annum,
- Numbers of EGMs per venue,
- Use rate of EGM game/platform,
- ‘Free’ spins won,
- Use rate of gamble feature,
- Average expenditure per EGM,
- Values of banknotes inserted within sessions of play,
- Bet values,
- Aggregate expenditure at venue,
- Expenditure rates for high credit value EGMs
- Time spent playing per player

We return to this issue when considering machines inside and outside casinos (Section 4.4 and Section 5 below).

3.3.3 Recommendations for Assessing UK Casino Public Health Impacts

The approaches that have been taken internationally to assess gambling impacts or costs and benefits differ substantially in terms of design. Based on our analysis of these studies, it is clear that an impact study carried out in any particular jurisdiction must address the questions deemed most important by policy makers and stakeholders within that jurisdiction. The nature of the questions to be answered as well as the resources available to carry out the work will dictate, to a significant degree, the study that is carried out in the UK. It is understood

that government, whilst wanting to undertake a cost benefit analysis, would want the study of the impacts of the new Gambling Act, 2005 Casinos to be as broad as possible so that impacts that have traditionally defied attempts to cost them in monetary terms (such as divorce or social capital effects) might also be measured in some way.

While a survey would certainly be one of the main tools for assessing the casino impacts and contributing to an integrated UK database, the challenge will lie in determining the appropriate sample size and framework to address a range of impacts and potential scenarios. Based on review of exemplary gambling impact studies and consideration of the proposed measures to be introduced in the UK, it is recommended that any public health impact study carried out in the UK include:

- A prospective, longitudinal general population survey;
- A survey of regular casino gamblers;
- Monitoring of appropriate area level public health indicator profile data;
- Data collection at the community level (e.g. Integrated/Health Impact Assessment).

3.4 Community and Cultural Life Impact Assessment

Although the public health perspective on problem gambling has only developed in the past few years, an even more recent debate relates to the focus on public health *problems* versus a broader systems perspective. Critics view the focus of the public health approach on gambling problems and ‘harm’ as too narrow and have argued that problem gambling should be only one issue of relevance in a broader discussion of life quality in relation to gambling (Brown & Raeburn, 2001; Korn, Gibbins & Azmier, 2003). In Canada and New Zealand, governments and activists have articulated a vision of ‘healthy communities’ in relation to gambling which entails taking a broad view of community health and gambling, considering gambling from a community perspective, and viewing problem gambling as only one indicator of community health (Jabin, 2006).

Large gambling developments can have profound effects on the communities in which they are situated, both negative and positive. While potential benefits of casino development include enhanced community services, infrastructure (transport and roads) and new employment opportunities, casino development can also lead to deterioration in personal and social values and in community and public spaces, to changes in provision of social and cultural services and to reductions in public safety and community satisfaction.

3.4.1 Community and Cultural Life Impacts Identified in the Summary Review

Abbot and Volberg, 1999, cite studies that examine the role of gambling in affirming individual and community identity, although the meaning of community is diverse, ranging across age, gender, geographical location, writers argue that forms of gambling such as cock fighting, bingo, poker machines and track betting can play a role in sustaining community identity and providing social support networks. Their review also gives examples of how community impacts can change as one form of gambling is replaced by another. They cite McMillen (1996) who notes that;

The shift in gambling development from local-national to international levels has resulted in a shift in power to the global or supranational level. It has also shifted policy emphasis from social to economic imperatives. Gambling is no longer a social activity shaped primarily by

community needs and values. Gambling has become big business, reclassified as part of the entertainment sector and integrated into mainstream economic development. What was once a cultural and social expression characterised by diversity and localised control is now a highly competitive global industry (McMillen, 1996, p.11).

Indeed, some communities that claim never to historically have had gambling tendencies such as the Pacifica in New Zealand find they are more susceptible than European communities to gambling problems when they are introduced to commercial gambling (Abbott and Volberg, 1999).

To say that there is a dearth of research on community and cultural life impacts associated with the introduction of new forms of gambling is an understatement. Much of the published literature focuses on the individual gambler as a risk taker or on gambling behaviour as an issue of individual self-control. For example, Browne (1989) conducted research in California cardrooms and identified the process of “going on tilt” as critical in the development of gambling problems for individual players. Rosecrance (1985) described a similar process—the “bad beat”—among horserace handicappers. More recently, Dickerson, Haw and Shepherd (2003) found that the majority of regular EGM players lose control over their spending and number of visits on at least some occasions.

There is a small literature that focuses on the relevance of social and cultural factors for understanding gambling behaviour. Much of this research emerges from the anthropological and sociological (particularly the social constructivist) traditions and is ethnographic and qualitative in nature. Anthropological studies of gambling activities—several focused on the influence of cash economies on traditional card games—were carried out in the mid-1980s among Aboriginal peoples in Australia, Papua New Guinea and Vanuatu (Goodale, 1987; Hayano, 1989; Hunter & Spargo, 1988; Rubinstein, 1987; Sexton, 1987; Zimmer, 1987). We also found a small anthropological study of the impact of casino legalisation on family networks in Atlantic City (Johnson, 1985).

In a similar vein in Western countries, we were able to find several studies of racecourse betting in Britain (Bruce & Johnson, 1994; Saunders & Turner, 1987) and of gambling among the residents of several mountain villages in northern Spain (Tubery, 1987). Two studies of the subculture of adolescent fruit machine gamblers have been carried out in Britain (Fisher, 1993; Griffiths, 1990) and a similar study was recently completed among adult Swedish machine players (Lalander, 2006). In the mid-1990s, Nickerson (1995) conducted a content analysis of newspaper articles related to the legalisation of casinos in Deadwood, South Dakota and Pavalko (1999) completed a similar exercise examining the introduction of tribal casinos in Wisconsin.

If we take “socio-cultural” more broadly to mean the distribution and patterning of gambling participation among population subgroups as well as attitudes and opinions about gambling, the social epidemiological literature becomes more relevant. There is a broad array of research showing that gambling participation in general, as well as participation in particular types of gambling, is linked to the communities in which these behaviours occur and to the norms and values of members of those communities. For example, differences have been found in the types of gambling preferred by middle-class and blue-collar gamblers, by men and women, and by White and Black Americans (Drake & Cayton, 1945; Henslin, 1967; Light, 1977; Strachan & Custer, 1993; Zola, 1964). Most epidemiological surveys of

gambling and problem gambling that have been carried out internationally include detailed questions about gambling participation and many such studies also include questions about attitudes towards gambling in general or toward specific gambling activities. These studies have been reported over several decades and come from many different countries (Abbott & Cramer, 1993; Amey, 2001; Azmier, 2000; Creigh-Tyte & Lepper, 2004a; 2004b; DCMS, 2001; Economopoulos, 2006; Gallup, 1999; Kallick et al, 1976; Kwan, 2004; Peltzer & Thole, 2000; Volberg, Toce & Gerstein, 1999; Sproston et al, 2000)

Large gaps in research on gambling in relation to community and cultural life lie in the areas of social structural factors that influence gambling, the impact of traditional and emerging cultural norms on gambling legalisation and participation, changing values and beliefs about gambling and the social impacts experienced by subgroups which can be linked to these patterns. We were able to find only two somewhat theoretical analyses of the interaction between contemporary forms of wealth distribution and the symbolic construction of problematic gambling (Borrell & Boulet, 2005; Volberg & Wray, in press).

Social capital and quality of life are also related to the community and cultural impacts of legalised gambling. Studies of social capital (and the associated concept of quality of life) have become more common in Western countries and social capital studies are now underway in Australia, New Zealand and Britain (Office for National Statistics general household survey) as well as the US. We identified one recent study of the relationship between casino gambling and social capital in the US (Griswold & Nichols, 2006). Analysing data from surveys conducted in 1978, 1988 and 1998, these researchers found that initial low social capital did not contribute significantly to the likelihood of casino adoption and that the presence of casino gambling within 15 miles of a community significantly reduces social capital and, they argued, should be a consideration in policy decisions.

As McGowan et al (2000) note in their critical review of the socio-cultural literature on gambling, this literature is dominated by social and clinical epidemiological research that is largely quantitative in nature. A further criticism is that culture within gambling studies tends towards interpretations of the exotic or other, emphasised by a specific focus on certain ethnic or cultural groups (Cassidy, CCLM 30/11/06). Representation from anthropology and other non-positivist social science disciplines is limited as are qualitative forms of research such as participant observation and content or discourse analysis. McGowan et al (2000) recommend that future studies incorporate prospective and longitudinal research designs. They further recommend that the methodological repertoire be broadened to include qualitative, phenomenological research as well as new epistemologies. Such work will better situate gambling research in the contemporary social sciences that attend increasingly to radicalised and marginalised discourses and include post-structuralist, feminist and critical theories of social organisation.

In general, in relation to gambling research, community well being has been addressed through three approaches; through aggregating individual responses in surveys designed to test the wider impacts of casinos or other new gambling opportunities, through community consultations and through monitoring community relevant variables such as house prices, changes in infrastructure (such as transport) and gains or losses made by community businesses.

Measuring community impacts in relation to geographical location is difficult. Some community members may benefit more than others, by employment of relatives in the new casino, for example. Geographical communities are diverse and contain a range of norms and opinions about gambling (amongst many other things).

Thus when surveys have tested community impacts through changes in public perceptions on community related variables they find contradictory results. Such variables have included whether respondents consider gambling either bad or very bad for society (National Opinion Research Centre, 1999), whether respondents intend to move house after the arrival of a casino (Nichols et al, 2002) or whether respondents “would favour the introduction of casino gaming into my local community because of its benefits to the local economy” (The Promus Companies, 1996).

3.4.2 UK Casino Community and Cultural Life Measurement Considerations

The social effects of gambling on communities are more difficult to measure than the economic effects, primarily because of limited quality data on social effects, the complexity of identifying and measuring social effects, and the difficulty of establishing a cause-effect relationship between gambling and social problems due to the difficulty of isolating any one factor that causes social problems (US General Accounting Office, 2000).

In our view, the best approach to assessing community and cultural life impacts from the Gambling Act casinos in Britain is a prospective, longitudinal study that assesses gambling participation, attitudes toward gambling, the impact of casinos on the community, and quality of life and social capital. We believe that additional small qualitative studies are needed but the topic(s) of such studies should emerge from initial more general assessments of the impacts of casinos on community and cultural life in Britain.

Griswold and Nichols (2006) adopted Putnam’s (2000) approach which established three areas important to measuring social capital: civic engagement, informal social engagement, and tolerance combined with trust. Spellerberg (2001: 26) of Statistics New Zealand proposes the following categorization:

1. Trust – both personal and generalized.
2. Civic engagement – voting and participating in community leadership.
3. Participation – clubs rather than social service activity.
4. Voluntary activity – formal and informal situations.
5. Giving – time, money, blood, information.
6. Meeting obligations – Family, cultural, religious obligations, paying taxes (cited in Griswold and Nichols, 2006, p379).

Social capital is measured in the UK through the General Household Survey and researchers have drawn on this data to follow up with specific groups. For example, Bowling and Gabriel (2003) used the GHS data and follow up interviews to examine social capital and older people. They recommend adopting a multidimensional model using triangulated data to take account of the different emphasis that people place on variables and to allow a measure of self assessment. Their ESRC/MRC study compared;

‘(i) the results of an analytic multiple regression model based on theoretically derived indicators of self-evaluated quality of life administered in the Quality of Life Survey (closed survey items and scales) with (ii) survey respondents’ own definitions of quality of life (categorisation of open ended survey questions) and (iii) the views of the sub-sample of the survey respondents who were followed up in greater depth’ (Bowling and Gabriel, 2003, p5).

We recommend this methodology be applied in the longitudinal studies in order to obtain a comprehensive measure of quality of life that can be tested in both casino and matched control areas and in relation to gambling behaviour outside casinos. Whilst there will be many reasons behind quality of life impacts, general trends in relation to gambling and the casinos will be discernable, especially if there are significant differences between casino and control areas and between those who gamble at various frequencies and those who do not.

CHAPTER 4: THE COUNTERFACTUAL

Objective: To measure the economic, social, health and community costs and benefits of the 17 Gambling Act casinos		
Specific	To gambling cost-benefit assessment	✓
Measurable	Through case control and addition of a module on the Avon Longitudinal Study	✓
Achievable	With appropriate investment and co-operation of ALSPAC	✓
Relevant	Will provide a series of measures to enable all stakeholders to assess whether positive and negative outcomes are likely to be linked to the Gambling Act casinos or some other factor(s), will provide data on what happens in the 'no intervention' case.	✓
Timebound	-1 to 4 years (pre-post implementation)	✓

If reliance is to be placed on measuring changes in indicator variables following a casino opening (and this applies whether one is looking for positive effects on the local economy or searching for negative social impacts such as a rise in crime), appropriate consideration must be given to the counterfactual. Typical approaches to defining the counterfactual are set out in Office of the Deputy Prime Minister (2004, Box A5.2). The simplest is to compare the pre- and post-situations. But this has a strong potential for yielding misleading conclusions. For example, if employment growth in a community were substantial in the years after a casino opening, it might be incorrect to attribute all, or indeed any, of this to the casino. The increase in employment might just reflect strong economic growth at the national level and it could be that more jobs would have appeared in the community even with an alternative, policy off (no casino) scenario. Official 3R guidance recognises that, in general, "it is unrealistic to assume 'nothing happens' " absent a policy intervention (Office of the Deputy Prime Minister, 2004, para. A5.45). It therefore recommends that alternatives such as longitudinal time-series analysis or matched area comparisons be considered. Formal time-series modelling may be constrained by lack of small area data if impacts are presumed to be highly localised since relevant information would be needed for a large number of areas apart from the casino host community.

In the American literature on impacts from casinos, ex post studies essentially follow a difference-in-difference approach whereby movements in indicators in communities where a casino opened are compared, over the same period, with similar places where the policy intervention did not occur. Such analysis may be 'macro' or 'micro' in terms of project design.

Examples of a 'macro' approach are studies by Evans and Topoleski (2002) and Grinols and Mustard (2006) which look at impacts on economic indicators and crime rates respectively. Both apply the difference-in-difference estimator in econometric estimation employing panel data. Evans and Topoleski focus on Indian gaming and compare measures such as employment, mortality and indeed crime rates for tribes (and their neighbouring areas) that had or had not introduced gaming facilities. Grinols and Mustard looked at the incidence of various categories of crime in counties that had or had not experienced a casino opening

(where casino counties were those with *any* type of casino). Evans and Topoleski reported statistically significant impacts on measures of economic activity from the presence of a casino. Both sets of authors found that casinos were associated with elevated crime rates with the effect growing stronger the greater the number of years since a casino opened (i.e. long-run outcomes were more adverse than short-run outcomes).

Even where the econometric approach in such studies is sound, much is lost in aggregation. Casinos in the US are very diverse in style, size and location and coefficients measure an 'average' effect that may not apply to any individual type of casino. Policy implications of findings may therefore be unclear. Similarly, if one is using a control group of locations comprising all counties in the US that do not have a casino, it is hard to define and gather enough data series to introduce control variables that cover all relevant extraneous factors that could account for movements in the dependent variable of interest.

It was possible in the American context to refine the econometric analysis to ameliorate, to some extent, limitations from excessive aggregation. For example, Evans and Topoleski split the sample of tribes with casinos into three categories based on market size (population within fifty miles). It is of interest that positive impacts from casino operations then lost statistical significance in two of the three sub-categories, revealing that economic benefits from opening a casino only occurred if the region were sufficiently densely populated.

Replication of this econometric approach in Great Britain after 2007 is unpromising in terms of its potential to illuminate policy issues relating to implementation of the Act. Even confining their remit to the study of tribal casinos, Evans and Topoleski had over 200 locations where economic outcomes could be compared with those in non-casino areas. This would allow separate equations to be estimated for sub-samples such as large and small casinos. Further, casinos in the US were opened at very different dates, creating further 'ripples' in the data that facilitated identification of impacts. However, in Britain there will be only seventeen Gambling Act casino locations, already a small number of cases for analysis even without disaggregation by the three size categories delineated in the Act. Further, all the casinos will open approximately at the same time rather than over a period of a couple of decades as in the US. It is therefore very unlikely that an econometric estimation will facilitate statistically precise quantification of impacts in the British case

Fortunately, the American literature also includes examples of studies within a more 'micro' framework. Of course, isolated case studies run the risk of generating findings where it is unknowable if they can be generalised to inform policy on whether and where to authorise new casino openings. However, a series of coordinated case studies can be designed so that comparisons of outcomes in different locations will be at least suggestive in policy evaluation. Kearney (2005) describes work for the National Gambling Impact Commission on whether riverboat gaming introduced in the 1990s boosted economic growth in host communities. Findings were generally discouraging. Tourism was generated only where there was already a tourism industry. Otherwise, casino patrons were mostly day trippers who spent virtually no time or money in local non-gaming establishments, limiting the potential for external benefits for local hospitality and retail sectors. Further, other work (see Siegel and Anders, 1999) illustrates the potential for riverboats to draw spending by local residents from other entertainment services in the area.

A series of studies by the University of Nevada, Reno, for the US Department of Justice echoed the econometric strand in the literature by explicitly comparing movements in indicators in places where a casino had opened with contemporaneous behaviour of the same indicators in non-casino communities.¹² But here there was a micro focus. Each of up to ten casino communities was matched with a similar county, identified as the closest match according to a variety of local area census statistics. Changes in factors such as bankruptcy, crime and suicide rates were then compared between each casino location and its match, for each of several years following the year the casino had opened. The particular project was concerned with negative social outcomes but could equally be applied to search for positive economic effects hoped to be associated with permitting casinos.

The strength of the approach is that it can both identify trends that occurred in several rather than just particular casino locations and highlight exceptions to general rules. Focusing on exceptions (the equivalent of the underused technique of concentrating on outliers in econometric models) may be as important to understanding as knowing the general relationship. For example, there was a tendency to observe increased bankruptcy rates in casino compared with matched non-casino counties; but the opposite was found for Biloxi. This was the only resort casino development in the sample. The inference was that generally casinos raise bankruptcy rates by promoting excess gambling by the local population and/ or by diverting expenditure away from local businesses. But where the casino was a facility drawing holiday makers into the area, this effect was reversed because there was genuinely new spending and new jobs that improved the position of local businesses and residents.

There are weaknesses of the methodology in terms of its potential to be used as part of a project on Gambling Act casinos in Great Britain. The geography is less favourable to the approach because, whereas many American towns with casinos are self contained, several possible locations in Britain are contiguous with other settlements, making it more problematic here to define the areas that have to be matched. Further, some locations for the seventeen casinos may possess such atypical characteristics that they cannot plausibly be matched with anywhere else.

We have proposed both a case control and pre-post methodology for both small and large casinos. It has been very difficult to agree a methodology for measuring the counterfactual for the regional casino and we would recommend further consideration of this issue once the location is finally confirmed. It may assist, however, in summarising the options we have discussed:

- Matched control in another region or country of the UK
- Matching demographic and socio-economic profile with sub-populations in other regions of the UK (collating a counterfactual from several regions)
- Accepting that arriving at a true counterfactual is impossible and developing a counterfactual for problem gambling only.

The latter option was the one adopted by the consortium at the present time (in advance of the regional casino location being finalised). We consider that the prevalence study will provide sufficient national data to allow comparison both before and after the casino development, providing the prevalence study is repeated at least one year post regional casino opening. In

¹² See, for example, Nichols, Stitt and Giacomassi (2000); summaries of the other modules in their project are provided at www.unr.edu

addition, we propose adding a module to the Avon longitudinal study which will provide data on gambling participation, harms and benefits at the individual and family level in the Avon region. This would allow comparison with the proposed longitudinal study for casino areas (including the regional casino).

Finally, we also note that in respect of both benefits and costs, the feasibility of isolating impacts from the casinos authorised by the 2005 Act is likely to depend on just where they will be located. A complicating factor is the large number of licences (that will perhaps exceed one hundred) being applied for under the 1968 Act for new casinos that could open ahead of 2009. These casinos will benefit from provisions in the 2005 Act that existing casinos can offer more machine gaming than hitherto. If '2005 casinos' are located in 'permitted areas' where the availability of gaming has also increased, at about the same time, as a result of licences granted under the old regime, it may prove impractical or even meaningless to identify an independent effect from their opening.

CHAPTER 5: IMPACTS OF GAMBLING OUTSIDE CASINOS

5.1 Risk and Protective Factors for Problem Gambling Outside the Gambling Act, 2005, Casinos

A public health approach implies concern with external, broadly structural and social conditions that influence gambling behaviour in more general ways. In the present context, this is taken to refer to the conditions that influence the participation of populations in gambling activities as a whole, as well as the structural features of games that influence individual patterns of play.

Perhaps the most compelling structural factor is the overall availability of gambling. Cornish (1978) termed this ‘ecologic opportunity’ and argued that, as with other public health issues, the more exposed individuals are to gambling, the more problems there will be. In other words, the greater the accessibility of a product or activity, the higher the prevalence of the problems associated with it. Commissions and official government reviews in a number of countries including the United States, Great Britain, Australia and New Zealand have all concluded—with varying degrees of qualification—that increased gambling availability can lead to an increase in problem gambling and that future increases have the potential to generate additional problems (Abbott, 2001; Gambling Review Body, 2001; National Research Council, 1999; Productivity Commission, 1999).

Results from a number of studies support this notion more specifically. Two surveys from the US and another survey from New Zealand have found that the location of a major gambling venue in a community is associated with rates of problem and pathological gambling that are approximately double the rates in communities without such venues (Abbott & Volberg, 2000; Gerstein et al, 1999; Welte et al, 2004). In the UK, two studies have documented this effect in relation to the National Lottery (Grun & McKeigue, 2000; Shepherd et al., 1998). Research has also shown, however, that increases in problem gambling may level out over time (the ‘novelty effect’) and that a coherent public health framework (awareness raising, prevention and targeted service provision) may minimize such an increase (Abbott, in press).

5.2 Dimensions of Gambling Participation

The characteristics of participation in various types of gambling have been found to influence gambling behaviour as well as the prevalence of problem gambling. In an analysis of respondents from four US states surveyed in the late 1990s, Volberg (2003) found that the prevalence of problem gambling was highest among past year bingo players, followed by pari-mutuel bettors and then by past year players of gaming machines. In New Zealand, Abbott and Volberg (2000) used logistic regression to identify the forms of gambling participation that were most strongly and independently associated with problem gambling. The highest odds ratios were identified for casino table games, gaming machines outside casinos, and gaming machines at a casino.

The British Prevalence Survey also found that rates of problem gambling varied by type of gambling activity and by the number of gambling activities engaged in during the past 12 months. People who participated in table games in a casino had the highest prevalence of problem gambling followed by those who bet on events with a bookmaker, then those who

bet on dog races. Problem rates were lowest for the National Lottery draw, followed by scratch cards. These patterns were similar for the both measures used in the survey (Sproston, Erens & Orford, 2000).

The question of whether features of certain games lead people to develop problem gambling is complicated by the fact that individuals who play certain games are also more likely to engage in multiple gambling behaviours. Volberg and Banks (2002) used factor analysis to determine that participation in multiple gambling domains (e.g., games of luck, games of skill, and leisure games) was a stronger factor predicting problem gambling than participation in specific activities. In the British Prevalence Survey, respondents were classified as minimal, moderate or high interest gamblers, depending on the number of types of gambling they had done in the past 12 months. Problem gambling was significantly correlated with the number of different forms of gambling in which respondents were engaged (Orford et al, 2003b). These findings raise the question of whether the risk for problem gambling lies more in engaging in multiple activities rather than in the 'inherent' riskiness of particular games.

A further consideration is the extent to which cultural or country-specific differences impact on gambling participation. The examples from prevalence research show that, whilst there are some agreed similarities (such as in EGM gaming impacts) different games have different impacts depending on the country in which they are practiced. Within the game domains there are emerging technologies which may make cross-cultural comparison more feasible, although this level of detail of technological comparability is rare. For example, 'table' games in casinos are becoming increasingly machine oriented, machines are a considerable source of revenue in UK bingo halls and 'racinos' have developed in Canada and the US. Rather than view these as discrete gambling domains, it may be more appropriate to analyse them as hybrids with technological and structural features in common. Differences and similarities in impacts then become more apparent and may well be related more closely to situational and context-specific issues. The variation in prevalence rates of problem gambling in different Australian states is an example: in Western Australia, machines are confined to one casino and levels of problem gambling are relatively low (0.7 %) whilst, in other states, machines are broadly distributed outside casinos and prevalence rates are relatively high (Victoria for example has problem gambling prevalence rate of 2.14%). There is also recent research from New Zealand and Australia which suggests that the link between machines (of any kind) and problem gambling is not straightforward. Much may depend on their situation and the context of their use (Livingstone et al. 2006)

5.3 Structural Characteristics of Gambling Activities

Two key classificatory frameworks have been explored in relation to problem gambling, including the skill-luck dimension (Walker, 1992) and event frequency (Griffiths, 1999). According to Walker (1992), games of pure chance include most lottery games and bingo as well as some traditional casino-style games such as roulette. Games of mixed chance and skill include card games such as poker, blackjack and baccarat. Chess is an example of a game near the pure skill end of the luck-skill continuum. Some types of gambling require players to construct subjective probabilities of the outcome of some event, such as betting on horse racing or sports betting. Walker (1992) argues that activities involving an intermediate mix of skill and luck are most attractive to 'serious' gamblers and are more likely to lead to gambling problems among regular participants than other forms of gambling (Walker, 1992). There is empirical evidence from a range of studies to support the existence of such a link.

Event frequency—the number of opportunities to gamble in a specified period of time—is associated with the speed at which outcomes (win or loss) are reported to the gambler and winnings are received. Gaming machines, with extremely high event frequencies, have been more extensively studied than most other types of gambling. Gaming machines provide high continuity but they also incorporate a number of related features that are associated with problem gambling, including rapid, arousing spans of play, frequent wins on a random and variable schedule, physical interaction, and light and sound effects (Griffiths, 1995; 1999).

5.4 Machines Inside and Outside Casinos

There are a number of provisions in the Gambling Act, 2005, that relate to the licencing, distribution and structural characteristics of gaming machines. The government is currently consulting on the regulations to be attached to these provisions. The impact of the resulting regulations on such matters as note acceptors, software, location and licencing will require careful monitoring. The DCMS in inviting consultation of the provisions made under section 240 has stated that it will ‘seek to use the powers under section 240 to regulate those areas of gaming machine’s operation which are fundamental to delivery of the licensing objectives, particularly the second and third objectives of fairness, and protection of children and the vulnerable’ (David Fitzgerald, 2006).

5.4.1 Machines and Problem Gambling

It is widely believed that gaming machines are associated with greater loss of control and that loss of control is a central feature of problem gambling. Whilst the majority of the people who play on electronic gaming machines do so without problems, several studies (Abbott & Volberg, 1999; Fisher & Griffiths, 1995; Griffiths, 1999; Wood et al, 2004; McMillen & McAllister, 2000) find that problem gambling is linked to increased access to electronic gaming machines.

Electronic gaming machines (EGMs) are the most profitable form of gambling; they account for 80% of casino profits in the United States and Canada and are found in a growing number of non-traditional gambling locations. Internationally, a growing proportion of problem gamblers contacting helplines or accessing treatment are identifying EGMs as their primary form of gambling (Abbott et al, 2004; Doiron & Mazer, 2001; Productivity Commission, 1999; Smith & Wynne, 2004). In addition to high intensity play and intermittent reinforcement, it is claimed that EGMs possess several features that foster loss of control including near misses, frequent small wins, the possibility of large jackpots, non-availability of payout probabilities and illusions of skill (Griffiths, 1999; Turner & Horbay, 2004).

According to the British Gambling Prevalence Survey, the rate of problem gambling among past year fruit machine players was 3.4%, which was higher than lotteries, football pools and bingo. This form of gambling was also more likely than most others to be engaged in on a weekly basis. Orford et al (2003b) found the prevalence rate among past week players to be much higher at 6.3%.

Previous research on machine gambling has generally been either experimental or ethnographic. Machine game features, both land and internet based, have been monitored in laboratory experiments and their impact on gambling behaviour has been measured under

controlled conditions (Loba et al, 2001; Ladouceur et al, 2005; Dickson & Shreiber, 2004; Weatherly & Brandt, 2003; Wolfson & Case, 2000; Zlomke & Dixon, 2006). Alternatively, qualitative studies have been conducted in arcades and machine gaming areas, particularly with young people (Griffiths, 1995; Coventry & Constable, 1999; Walker, 1992). Neither of these designs will, however, render sufficiently detailed evidence with which to monitor the impact of new machines entering the UK market.

Experimental studies are not easily generalisable to 'real time' population behaviour and observational studies are not easily generalisable to wider populations. There is a need to connect the data concerning machines with data on the behaviour of players. Linking these two can provide reliable and accurate information concerning a number of key issues. Firstly it can be used to accurately identify problem gamblers and if monitored over time can trace changes in their problem gambling behaviour. Secondly it can accurately and reliably test how this behaviour is linked to the design characteristics of venues and machines.

An Australian study by Dickerson (1996) indicates the utility of such research. Dickerson interviewed regular machine gamblers in New South Wales every month for 18 months. He showed that regular machine gamblers all intermittently developed difficulties controlling their gambling whether or not they took measures to restrain their activity, such as setting limits of time or money. It was the regularity of the activity which was the key variable, not their behaviour, attitudes or belief.

Dickerson's study had a number of important implications. Firstly, this research established that all regular players are a 'vulnerable' population regardless of their demographic, personal characteristics, attitudes or beliefs. This suggests, among other things, that 'education' to affect players' beliefs and attitudes may be of minor significance, while access and inducements to regular play may greatly affect rates of problem gambling. Secondly, it also raises the possibility that regular consumers of other continuous types of gambling such as machine bingo, casino table games and internet betting and gaming may also be at significant risk to the point where they could be classed as a vulnerable group under the Gambling Act, 2005.

Thirdly the study showed that problem gambling behaviours fluctuated over time. Such fluctuations have also been found in the few prospective studies that have followed gamblers and problem gamblers over varying periods of time (Abbott, Williams & Volberg, 2004; Slutske et al, 2003; Vitaro et al, 2004; Winters et al, 2002). Patterns of player behaviour were not static and could become more or less problematic. This finding has focused attention away from the personalities of individual players and more on identifying key variables in the relationship between regular players and the characteristics of machines and venues that might influence these fluctuations, including protective effects which mitigate problematic behaviour.

These challenging findings clarify the need for more precise information concerning the interaction of machine and gambler because they raise questions concerning harm minimisation strategies in relation to education, attitude and machine design.

One way in which relationships between these critical variables have been studied has been through the analysis of quantitative data collected on a routine basis through machine use (Raven et al, 1995; Soltys et al, 2003). Casinos increasingly use loyalty cards as part of their

marketing (The Namibia Economist, 2004, Soltys et al, 2003). The huge amount of demographic and behavioural data these smart cards carry is segmented to ensure the efficacy of player incentives. This provides a potentially rich source of data concerning player behaviour in relation to machine and venue characteristics.

Linking information concerning both the player and the machine, it is theoretically possible to analyse patterns of play in relation to demographic variables as well as in relation to issues such as speed of play, stake, size and nature of prizes, type of graphic and audio display, and possible preventative factors such as on-screen information concerning odds, money limits, money spent, time spent, losses and so forth.

Currently, such ideas are hypothetical or rest solely on laboratory experiments such as those carried out most recently by Ladoucer et al, in Canada (2005). The laboratory conditions under which player behaviour was examined in relation to structure and type of game gives clues as to the impact of game or machine design but there is little information concerning real life activity, which could vary quite markedly from experimental conditions. Some work has recently been carried out (Wynne & Stinchfield, 2004) evaluating the effectiveness of responsible machine gambling measures in Canada, but this did not include the use of loyalty cards. A recent study has been conducted by the Nova Scotia Gaming Commission (NSGC) and we consider that replicating the methodology of that study in the UK may be beneficial. Analysis of loyalty card data would allow a comparison of real life activity compared to experimental results (Raven et al, 1995; Rogerson, 1998).

Loyalty card data could also test the impact of advertising and marketing campaigns, both promotional and preventative. Do health warnings or advertising promotions affect play? We anticipate the government would be assisted by this information in formulating an effective harm minimisation public health approach. This information would provide an additional source of regional impact data (adding to the data to be collected by the intercept study in new casino areas) since the demographic information would give a comprehensive picture of the regional market. For example, it will give precise information about how far and how frequently gamblers are prepared to travel to venues with gambling machines.

Loyalty card data alone does not provide information about beliefs or information about the impact of player behaviour on relationships and communities. Robust and comprehensive data on problem gambling behaviour and harm minimisation strategies can be obtained by requiring both researcher access to the smart card data and follow up sample interviews (Nesbit, 2005). This would be very valuable information from the government's perspective and a huge step forward in knowledge about responsible gambling policies and practices in more general terms for the operator, academic, research and public health practice communities.

There is considerable concern from local authorities in the UK about how they are to regulate machines in pubs, clubs and other non-casino venues. These sites are allowed 2 machines as of right and up to 4 with a licence. Unlike other countries, such as New Zealand and Australia, there is currently no requirement for online monitoring of these machines in the UK. In New Zealand all machines, including those in community settings, are monitored online by the regulator (McMillen & Allister, 2000). This is primarily for fraud prevention and enabling the detection of illegal practices such as the use of unregistered machines or non-payment of tax. However, it could also allow for the testing of a variety of hypotheses

about gambling behaviour and machine characteristics as they develop with new technologies. In particular, it will allow the authorities to compare the effects of different forms of control on gambling behaviour patterns. This is not currently contemplated in the UK where it is proposed to collect only aggregate data on machine gambling.

There are 2 methods through which player behaviour can be tracked both inside and outside casinos: online monitoring and card technology (e.g. 'smart cards'). Much of the debate in the UK has concerned the latter. In 2001, the Home Office conducted a review, the primary concern of which was allowing the industry to keep up to date with technology. At that time, it was the industry that was pressing for cashless, or coinless systems. In 2001 it was estimated that adding a note acceptor to a machine would cost from £250 to £300 and that the cost of adding a prepayment card reader would be about £170 (Home Office, 2001). In 2003, Paul Collis of Stanley Casinos Ltd in correspondence to DCMS stated that they 'support the promotion of 'Cashless and Smart Card' developments for AWP's and Gaming Machines as these are simply a reflection of normal activities in our modern society' (<http://www.culture.gov.uk/NR/rdonlyres/6F132C9B-656C-42A6-8A72-0C713789C002/0/part3.pdf>).

Five years later, and as a consequence of implementation of the Gambling Act, 2005, the same technology is again being reviewed but with a focus on responsible gambling, licensing conditions and codes of practice (Gambling Commission, 2006). Thus, in its consultation exercise on Licence Conditions & Codes of Practice, the Gambling Commission asked:

How far is it feasible to use technology such as smart cards and loyalty systems to track, and intervene in, problem gambling behaviour? What behaviour would suggest problem gambling? To what extent is it possible to identify problem gambling in the remote gambling sector based on patterns of play?

Interestingly, when linked to the identification of problem gambling, opinions were mixed. Of the 74 responses to the consultation, 28 made comment. The responses fell broadly into the following themes:

- i. Caution that the level of capital investment would have to be justified in terms of profit. For example the BCA stated that it would need 'a 'machine park' of not less than about fifty machines to justify the most modern data capture technology' (Ameristar, British Casino Association, Rank);
- ii. Acknowledgement that the technology was already partly in use but scepticism about the feasibility of using this technology to identify problem gambling behaviour (including the need for more evidence). For example, 'the amount anyone bets or the frequency of visits is all any staff would have to go by' (A& S Leisure Group Ltd, ABB, Bingo Association, BACTA, British Casino Association, Carlton Clubs, Harrahs, Littlewoods Gaming, Party Gaming, Prime Table Games);
- iii. Technology is in use and could be used to promote responsible gambling. Rank, for example, stated that 'it is possible if smart cards are linked to a sophisticated player tracking system, where loyalty points or mystery prizes are used as the traditional incentive for players to "plug in". In such cases, it is actually easier to monitor exact amounts and individual patterns of play, than it is on a normal gaming table. If

information is being recorded on a tracking system, the operator is able to interrogate reports to assess play. For example, length of time spent on machines, frequency of play, amounts won or lost can all be used to build up a profile and trigger “early warning” of a potential problem gamblers’ (see also, Advertising Association, Bellringer, Camelot, GamCare, GoodCorporation, Roy Hilsley, RIGT);

- iv. The way in which data on individuals was collected and stored, and the use to which it could be put, would need to be compliant with relevant privacy and data protection law (Advertising Association, Bingo Association, Methodist Church);
- v. Customers, the large majority of whom are not problem gamblers, may object to being monitored in this way (ABB, Rank, The Remote Gambling Association Ltd);
- vi. Technologies could be a ‘double edged sword’. These cards are used to fine tune product preferences towards individual customers so that they gamble more (Bellringer, Casino Operators' Association of the UK);
- vii. It may not be appropriate for sports betting. Many customers may use an LBO only once and, for issues of customer privacy, many individuals do not wish to provide personal details for what is a retail transaction (ABB, RaceCourse Promoters Association).

Roy Hilsley notes that the Gambling Commission omitted to ask ‘will remote monitoring (where feasible) be proposed to facilitate compliance auditing, data gathering, or other monitoring or control purposes?’ Kroopier Technologies did address the issue of monitoring under question 10 which referred to compliance with technical specifications. They similarly ask,

How are the outcomes of the games being monitored?...We propose that an **independent monitoring system** is put in place in order to allow the regulators, auditors, players and the operators themselves to verify at any moment that every single event of the game is fair, legal and has not been manipulated. The manipulation attempts could come from external attacks, but also from internal attacks. We believe that an independent monitoring system has to be able to cope with the technical requirements of existing platforms at a low cost of integration (Kroopier Technologies).

The distinction, often muddied, between tracking players through cashless systems to encourage responsible gambling and on-line monitoring of machine play for audit and regulatory purposes is mirrored in the differences of approach in monitoring/tracking machine play in places such as Queensland, Australia and Nova Scotia in Canada.

In Nova Scotia, a player tracking study and smart card system was implemented primarily with the aim of promoting a responsible gambling approach. A ‘Responsible Gaming Device (RGD)’ was attached to every VLT in two communities and all players wishing to use these VLTs had to use a player card. The card gave the player access to personalized, interactive features that provided real-time information about their gambling behaviours. The research commissioned by the Nova Scotia Gaming Corporation did not assess the technology, but rather examined the impact of the responsible gaming features it provided access to. The features allowed players to see exactly how much they spent, how long they played and also gave them the power to exclude themselves from playing during certain time periods. Player

cards could be used to identify gamblers vulnerable to problem gambling by virtue of frequency of use. The scheme was evaluated (Omnifacts Bristol Research, 2007; Focal Research, 2007) and considered to be sufficiently successful to warrant progress to the next stage of rolling the technology out to all machines in the province. Data collected through these player card systems is, however, subject to the kind of ethical and data protection issues identified in the consultation above – it begins from the individual and therefore raises the question of whether there is an obligation to act on information that suggests someone may be experiencing problems. We consider this to be an ethical and treatment/prevention issue rather than an impact assessment priority.

The Queensland Office of Gaming Regulation stated in their submission to the Gambling Commission that:

All Electronic Gaming Machines (EGMs) in Queensland must be connected to an Electronic Monitoring System (a centralised computer monitoring system), which is underpinned by the QCOM communication protocol. QCOM standardises the rules and methods an EGM uses to communicate over a monitoring network, allowing the EGM to be remotely audited over a network and facilitating the operation of many types of EGM related services such as linked jackpots. It allows for remote adjustments of return to player where multiple variations have been approved, adjustment of bank note acceptors, messages, display of time, etc. QCOM is recognised as a stable, robust and reliable wide area communications protocol. As a result, jurisdictions such as the Northern Territory, Tasmania and New Zealand have adopted it.

As we have noted above, a considerable amount of data is available through this system. For example, a recent report recommends that, because of the potentially negative problem gambling impacts of EGMs, the system can be used to implement a ‘risk profile system’ on the basis of the following data available through a computer monitoring system in Victoria, Australia:

- Expenditure per specific EGM game/platform per annum,
 - Numbers of EGMs per venue,
 - Use rate of EGM game/platform,
 - ‘Free’ spins won,
 - Use rate of gamble feature,
 - Credit values of EGMs,
 - Geographic and social significance of location, for example, in or near a shopping centre or within an area of relative socio-economic disadvantage,
 - Hours of availability of EGMs,
 - Average expenditure per EGM,
 - Values of banknotes inserted within sessions of play,
 - Bet values,
 - Aggregate expenditure at venue,
 - Expenditure rates for high credit value EGMs
- (Livingstone et al, 2006, px)

From these observations and responses it is clear to us that on-line monitoring data can provide data relevant to assessing the impact of machines both inside and outside casino. This data originates from the machine and can be suitably anonymised and aggregated. It would allow the assessment of impacts relevant to availability, location, and type of machine.

Because the extent of the technological capacity (particularly in smaller venues) and quality of the data all seem to vary according to method, site and location, we strongly recommend that a feasibility study should be implemented with a view to piloting and rolling out a wider research study within the next 2 years.

Distinctions also need to be made between machines inside casinos and those outside. The government estimates that there are currently around a quarter of a million machines in the UK. Although some of these will be inside casinos, the majority are outside. The Gambling Act, 2005 will reduce the numbers of machines in unlicensed premises, such as chip shops and taxi cab offices. The Act gives powers to regulate gaming machines, limiting them to licensed premises such as Adult and Family Entertainment Centres, Bingo Halls, Travelling Fairs, Pubs and Clubs. The impact of licensing is not clear, particularly the impact on the location, concentration and number of machines. Evidence from abroad, such as in Australia and New Zealand where the numbers of machines have grown considerably, suggest that the impact of licensing premises under the Act requires monitoring. This is, in part, the responsibility of the Gambling Commission and Licensing Authorities. However, the impact of any potential increase in numbers, concentration and emerging technologies outside casinos on gambling behaviour and problem gambling will require careful research to inform such regulation.

5.4.2 Young People and Machine Gambling

Young people in the UK are, somewhat unusually in an international context, allowed to gamble on Category D slot machines. It is therefore not advisable to compare studies of legal gambling in Britain with studies from the US, Canada and elsewhere in the world where any youth gambling on machines is illegal (and therefore viewed *a priori* as a problem). It is, however, important to look to these other countries to see how far young people do access illegal gaming opportunities when considering the potential impact of expanding such opportunities in the UK. Such studies find that it is possible that young people can breach the age restrictions and gamble illegally. For example, early youth gambling studies found evidence from the US that 64% of young people aged between 16-17 years reported regularly gambling in Atlantic City casinos (Arcuri, et al. 1985) and reviews by Griffiths (1995), Jacobs (2000) and Haroon and Derevensky (2002) all find evidence of studies involving young people gambling illegally on machines in the US and Canada and on lotteries in the US, Canada and the UK. Over the last 5 years several measures have been put in place to reduce the illegal access of youth to casinos (e.g. Harrah's Project 21). However, there is some evidence to suggest young people can illegally access machines outside casinos. The most recent study from the Ontario based Responsible Gambling Council (White et al, 2007) reports 20% of 15-17 year olds gambling on arcade/video games, with the most popular game being Poker (45%).

The recent National Lottery Prevalence study on youth gambling in England and Wales (NLC/IGRU, 2006) reported that gambling participation among young people has decreased. In 1999 one fifth of young people had never gambled for money and by 2006 this had risen to over a quarter (26%). The largest decrease had been in scratchcard use (from 63% in 2000 to 28% in 2006), Lotto (34% in 2000 to 16% in 2006) and fruit machine gambling (from 65% in 2000 to 54% in 2006). The National Lottery Commission has implemented several measures to discourage and regulate underage gambling with lottery products and these prevalence data

suggest that the measures are having an effect. What is not known is the proportion of fruit machine gambling conducted illegally on machines only legally accessible by adults. The study finds that most young people gamble on machines in arcades (39%) with others gambling in a 'pub, restaurant or other location (22%)' but does not attempt to distinguish between legal and illegal machine gaming.

The National Lottery Tracking Studies (Fisher, 1997; 1999; Ashworth et al., 2000; NLC, Griffiths & Wood, 2006) consistently link problem gambling in youth to machine gambling (whether legal or otherwise). The prevalence of youth problem gambling on fruit machines is higher than on any other form of gambling, although it is decreasing (from 3.5% in 1997 to 2.8% in 2006). This is followed by problem gambling on scratch cards which has also decreased (1% in 1997 to 0.3% in 2006). Overall, combined problem gambling scores for 12-15 year olds in England and Wales have decreased by more than a third from 5.6% in 1997 to 3.5% in 2006. A recent study in Scotland (Moodie & Finnigan, 2006) reports higher rates at 9% from a smaller sample drawn from two regions in Scotland across a wider age range (11-16) although this study included problem gambling that may have been linked to Internet gambling.

The Gambling Act 2005 has a number of provisions which may be relevant to the access of children and young people to illegal machine gaming. Whilst the precautionary principle of the Act has meant clear safeguards have been implemented to safeguard children and young people, their effectiveness and impact may require further assessment. We consider the main areas for impact assessment to be:

Controlling access of young people to casinos;
Controlling access of young people to adult gaming machines in family entertainment centres;
Measuring the impact of increased machine gambling opportunities in the adult population on children's current and future gambling behaviour

5.5 Internet Gambling

Beyond expansion in the availability of casinos, machines and lotteries, the most notable recent change in access to gambling has been a significant shift in the availability of gambling from gambling-specific venues to a diversity of social settings not previously associated with gambling. A related development is the growth of gambling on the Internet, bringing casino gambling, sports betting and lottery play directly into homes and workplaces. It is estimated that there are over 2,000 Internet gambling sites currently available online, with approximately 0.9 million users in the UK alone (RSe Consulting, 2006). As encryption technology and the security of financial transactions improve, internet gambling will continue to increase. Internet gambling has a wide range of potential impacts. These include negative impacts on consumer interests (e.g. services conducted in an unfair manner), on individual gamblers and their families (largely viewed as resulting from a potential increase in problem gambling resulting from greater accessibility, both in time, such as during short breaks from work or family activities; and in space, such as from home and from the workplace), and on the scope for criminal activities such as money laundering (Clarke et al., 1998).

Of particular relevance to this analysis is the question of whether Internet gambling will substitute for existing forms of gambling. If displacement occurs, land based operators and governments are at risk of losing substantial proportions of their revenue-base. On the other

hand, if Internet gambling grows without substituting for existing gambling, then the economic and social impacts on gamblers and their families may increase.

It has been argued that online gambling has a number of features that suggest it will contribute significantly to problem gambling development (Griffiths & Wood, 2000; Griffiths, 2003; BMA, 2007). However, there is to date insufficient information to assess this assertion. A review has found that the profile of internet gamblers does not entirely match the profile for problem gamblers on land based facilities particularly in education and income levels, both of which may be protective factors for problem gambling, although the potential for internet gambling to exacerbate existing problem gambling has been observed by GamCare in the UK (RSe Consulting, 2006) and by Petry (2006) in the US. Further research is recommended by both RSe Consulting (2006) and the BMA (2007) to monitor usage and identify links between usage and problem gambling in different sectors of the population.

A very recent study of Internet gamblers has just been released (Parke, Rigbye, Parke & Williams 2007). The study used quantitative and qualitative methods to assess demographic characteristics, styles of play, and other behaviours among Internet casino and poker players. The study did not include Internet gamblers outside these two groups and there was no effort to assess gambling-related problems. Some interesting findings emerged from this study: Internet casino players were more likely to be female than male while Internet poker players were three times more likely to be male than female. Internet casino players were significantly older than Internet poker players. The majority of online gambling took place at home and in the evening and the characteristics of play (e.g., length of session, sessions per week, spending per session) were significantly different for women and men. The researchers noted that the gender gap in Internet gambling seems to be closing with more women beginning to play Internet casino games in the privacy of their homes. From a gender perspective this may signal a positive impact for women who may have greater freedom and choice to participate in gambling in this way.

There is a study underway of gambling on the Internet in Ontario that may soon provide important new information about the demographics and behaviour of Internet gamblers as well as the prevalence of problem gambling. The investigators, Wood and Williams, note in their study abstract (posted on the Ontario Problem Gambling Research Centre website) that a pilot study found a 43% prevalence rate of problem gambling using the CPGI among 1,920 people accessing an online gambling portal. The main study involves a triangulated research design that includes a random digit dial survey of approximately 13,000 Ontario adults, in-depth interviews with up to 650 self-identified Internet gamblers, secondary analysis of Internet gambling data from several provincial prevalence studies and an Internet-based survey of 4,000 patrons recruited directly at online gambling sites.

The RSe Consulting report to the DCMS notes that there are at least 3 potential crime impacts of internet gambling: hacking (where hackers can alter games to enable players to win more money, or otherwise impact on play), fraud by operators (where operators may take bets but not pay out money) and money laundering (citing a case in 2001 where 'one of Canada's largest organised crime family's high tech illegal gambling operation was raided and exposed' (RSe Consulting, 2006)). Where these impacts are detected in the UK, they will be covered by the Crime Study recommended in Phase 1.

5.5.1 Youth Internet gambling

Whilst there are clearly concerns about the potential for underage gambling on the Internet (see for example, BMA, 2007) there is not sufficient evidence to fully gauge the nature and extent of the problem in the UK. The Canadian study reported above (White et al, 2007) found that one in ten respondents gambled on the Internet. A recent US survey reported weekly use of Internet gambling sites among all male youth increased from 2.5% in 2005 to 3.0% in 2006. However, it seems the younger age group may be reducing their involvement. Weekly use of Internet gambling in boys under 17 reduced from 2.6% in 2005 to 0% in 2006, but rose significantly among male youth over the age of 17 from 2.3% in 2005 to 5.8% in 2006 (Annenberg Public Policy Centre, 2006). Moodie and Finnigan (2006) found that of their sample from two Scottish regions (N=1,980) 15% gambled on the internet. These were not, however, evenly distributed across the sample. Gamblers were categorized in three groups: non-problem, 'at risk' and problem gamblers. Problem gamblers were more likely to be internet gamblers; 32% of those classified as problem gamblers also gambled on the internet compared with 19% of 'at risk' gamblers and 12% of non-problem gamblers. The NLC study on 12-15 year olds reported 8% using 'any other gambling e.g. gambling on line' in England and Wales (NLC/IGRU, 2006).

5.6 Bingo

Much of the focus in gambling research has been on lotteries, casinos and electronic gambling machines. There has been relatively little research focused on bingo despite the recent rapid evolution of bingo games based on technological advances. The Gambling Commission states that the main change affecting the UK bingo industry under the 2005 Act will be 'the formal requirements for social responsibility policies and procedures to ensure fair and open gambling and the prevention of harm to children and other vulnerable people'(GC, 2006, p1). A further concern in Britain is that bingo clubs may press to be allowed to operate electronic games similar to the Fixed Odds Betting Terminals now available in betting shops.

Dixey (1987, 1996) has written about bingo as a female leisure pursuit in Britain in the 1970s and provided insight into the role of gambling in the lives of women in general. Other studies of bingo players have been carried out in British Columbia, North Dakota and New Zealand (Volberg & Abbott; 1997; Volberg & Glackman, 1995). In comparing results from these different studies, it appears that bingo players are made up of at least three distinct groups. One group of traditional bingo players tends to be older women with low levels of education and income. A second group tends to be younger women from non-European backgrounds who may become involved in bingo as a means of acculturation. A third group of players is younger and significantly more likely to be male than other bingo players. These individuals are better educated, have higher levels of disposable income and are interested in electronic bingo as well as many other types of gambling. Rates of problem gambling are highest among this last group of bingo players (Volberg & Glackman, 1995).

There is some media evidence that the smoking ban in Scotland has had significant negative impact on bingo revenues. Creative Bulletin reports a drop in turnover from between 14%-27% and closure of 7 venues, leading operators to seek to widen their traditional customer base (women comprise 73% of bingo players in the UK) (Bowery, 2007). Thus impacts may derive from a combination of smoking legislation, gambling legislation and also an increase in the

online bingo gambling market where supervision of individual players and detecting early signs of negative impacts is more difficult to achieve.

5.7 Betting

As noted above, betting on sports requires players to construct subjective probabilities of the outcome of events, much like betting on horse racing. While much of the focus of gambling research has been on electronic gambling machines, there is evidence that track betting is associated with high and enduring rates of problem gambling (Abbott & Volberg, 2000; Abbott, Williams & Volberg, 2004).

In the U.K., there is also the question of the relatively new Fixed Odds Betting Terminals (FOBTs). There are now approximately 33,000 FOBTs at 8,500 betting offices throughout the country. The policy question being asked is whether FOBTs are more or less dangerous than casinos with large numbers of machines?

FOBTs are increasingly associated with reports of problem gambling by players. In addition, lower stakes versions of these devices have recently been appearing in bingo clubs and arcades. Some research suggests that FOBTs do not constitute a significant problem, mainly because the use of them is confined to a small proportion of the population (Europe Economics, 2006). However, this research has been criticised on the grounds of methodology analysis and interpretation of findings (Hancock, 2006; Reith, 2006). The international research evidence demonstrates that FOBTs possess the characteristics of those forms of gambling most associated with gambling problems, namely high event frequency and opportunities for rapid reinvestment. It is certainly possible that such machines have the potential to increase problem gambling in the U.K and, therefore, we recommend that these developments be closely monitored.

According to the British Horse Racing Board¹³ £5 billion was bet off-course in 2000/01 and a further £84 million was bet on-course. Although the industry experienced a drop in attendance during the 1980's racing posted an attendance figure of 6 million in 2004 confirming its enduring popularity¹⁴. There are currently around 8,500 betting shops across the country and in 1999 13% of the population reported betting on horse racing. The sports betting industry has continued to evolve and more recent data on betting practices and links to problem gambling will be provided by the forthcoming Gambling Prevalence Study. We anticipate that, apart from the impacts of machine gambling connected to FOBTs and covered under the impact assessment for machines (below), the main impact of the Gambling Act, 2005 for the betting industry will be the capacity for compliance with responsible gaming policies which may result in increased prosecutions, and potential economic impacts on the industry as the capacity to offer betting expands to other parts of the gambling sector (such as casinos). The former will be covered by the crime study already recommended. The latter requires an extension of the economic impact assessment to include a 'displacement study'.

¹³ <http://www.goldsmiths.ac.uk/press-releases/pressrelease.php?releaseID=73>

¹⁴ http://www.britishhorseracing.com/inside_horseracing/racingindustry/history.asp

CHAPTER 6: A UK GAMBLING IMPACT ASSESSMENT FRAMEWORK

The overall framework we recommend for impact assessment of the Gambling Act, 2005, Casinos and other forms of gambling outside casinos takes account of a scoping of the literature and virtual workshop discussions in all four module areas. We provide an integrated framework that addresses the different impact across studies to enable triangulation. The Framework is summarised in Table 2. In order to enable impact assessment of consumer surplus, we consider the framework should capture proximal and distal impacts pre-post casino development using a sample of matched controls for small, large and regional casinos through two longitudinal studies (one attached as a module to the UKHLS) and an Integrated Health Impact Assessment. These studies, in addition to a specific crime impact study, an intercept/family attitudes study and a displacement study will capture the range of social impacts both positive and negative from the new casino developments. Finally, we propose adding a module to the Avon longitudinal study to act as a counterfactual measure for the regional casino.

The total cost of the framework is estimated at approximately £8,010,000 spread over five years (approximately £1.6m per year). This cost should be considered in the context of the rapid expansion of new Internet and land based gambling, including forecasts of the effects from new machine gaming in the 17 casinos of player losses at £8b per year, consumer surplus ('recreational' players only) at £3.17b and social costs using a rather pessimistic basis of the Australian Productivity Commission of £1.8b (Crane, 2006).

Further details of the studies referred to in this framework are given below.

Table 2: Gambling Act, 2005, Impact Assessment Framework Studies

Study	Time Frame	Impact Assessment Area	Impacts	Contribution to Measurement of Consumer Surplus	Sample size	Cost £
Longitudinal	2008-2012 Continuous	New 1968 Act Within 5 miles Within 10 miles Small Within 10 miles Within 20 miles Large Within 20 miles Within 50 miles Regional Time travelled >1hr 1-2 hrs <2 hrs	Gambling participation Attitudes Incidence of problem and pathological gambling Personal characteristics Personal impacts Family impacts Work and employment impacts Financial impacts Legal impacts Quality of life impacts Economic well being	Gambling participation Incidence of problem and pathological gambling Travel cost method	13000 (general population)	£4,500,000
Longitudinal Module (e.g. on UKHLS)	2008-2013 continuous	National	As above, all impacts outside Gambling Act, 2005 casinos	Gambling participation Incidence and ‘flow’ of problem and pathological gambling (other than new casino gambling)	UKHLS sample plus follow up. A budget of £600,000 x 3 waves over 5 yrs	£1,800,000

Study	Time Frame	Impact Assessment Area	Impacts	Contribution to Measurement of Consumer Surplus	Sample size	Cost £
Intercept: Adult & Youth Gambling Attitudes and Behaviour	2008 (4 weeks) Family Ent. Centres 2009 (8 weeks) Small/Large 2010 (8 weeks) Small/Large Regional Post Casino. To include leisure areas accessible to children 2011 (8 weeks) Small/Large & Regional	Youth/parents/carers: Family Entertainment Centres (local) Casino Local/Regional Adult Casino Local/Regional/National	Youth gambling participation Parent and youth attitudes to gambling Casino gambling participation Incidence of problem and pathological gambling Increase in visitor numbers Increase in visitor spending Economic well being	Gambling participation Incidence of problem and pathological gambling Travel cost method Economic well being	8000 (casino visitors over 3 years) 500 children 250 parents/carers	£370,000

Study	Time Frame	Impact Assessment Area	Impacts	Contribution to Measurement of Consumer Surplus	Sample size	Cost £
Integrated Impact Assessment	2007 – 2012 Pre-Post	Casino area Local Strategic Partnership/PCT	Police Activity Crime rates Crimes (and public perceptions of) linked to gambling Suicides Divorce Debt Child protection referral rates Domestic Violence rates Referrals to mental health, drug and alcohol services Youth offending rates Education: attendance and attainment Public Health data sets Availability & outcomes of gambling related services Population change Employment change (inc. no. & type of jobs created/lost) Revenue from business change Change in percent of land derelict Number of new VAT registrations Property values		Total population covered by LSP/PCT	£350,000

Study	Time Frame	Impact Assessment Area	Impacts	Contribution to Measurement of Consumer Surplus	Sample size	Cost £
Player-Gambling Tracking Feasibility Study	2008-2010	National	Gambling participation Structural features of machines Internet gambling	N/A	To be determined – dependent on industry co-operation & access to Internet sites & Machines	Feasibility - £5000
Youth Gambling Prevalence	2010	National	Problem Gambling in Youth	N/A	NLC tracking study (2006 N= 8017)	Additional cost of problem gambling screen applied to Internet gamblers (approx. 10% of sample) est. at £5,000
Youth Gambling Participation	2008-2022	National	Development and causes of problem gambling in Youth		15,770 households (Next Steps sample)	Additional module, estimated at £500,000

Study	Time Frame	Impact Assessment Area	Impacts	Contribution to Measurement of Consumer Surplus	Sample size	Cost £
Crime Impact Study	2007-2011	National and Casino area	All types of gambling related crime, reported and unreported		Offender Index Offences Index Screening 5000 Follow up 1000 40,000 (BCS 4 questions)	£200,000
Counter Factual	2007-2010 Annual data collection	Avon	Gambling participation Attitudes Personal characteristics Personal impacts Family impacts Work and employment impacts Financial impacts Legal impacts Quality of Life impacts	Incidence of problem and pathological gambling	1500 Randomly Selected from ALSPAC regional study sample	Not known (estimated at £250,000)

Study	Time Frame	Impact Assessment Area	Impacts	Contribution to Measurement of Consumer Surplus	Sample size	Cost £
Economic costs and benefits	2008 and 2012	Local, Regional, National	Consumer Surplus Cost of impacts on Families Employers Communities (including health and treatment services, social services, police, education etc) Civil and criminal justice system	N/A	All studies within UKGIA	£15,000
Displacement	2012	Local, Regional, National	Displacement of spending between different gambling opportunities covered by the Act		Econometric analysis of figures on spending in the new casinos and information in existing data series (e.g. lottery sales, betting volumes, derived from Revenue and Customs returns on GGR)	£15,000

6.1 Cost Benefit Assessment

6.1.1 Casino related consumer surplus

Objective: To measure the economic benefits of the 17 Gambling Act casinos		
Specific	To gambling benefits (consumer surplus)	✓
Measurable	With a known or estimated demand curve, the sum of these benefits across consumers is easily calculated.	✓
Achievable	When combined with accurate measures of problem gambling; assumes problem gamblers gain consumer surplus up to the level of play of median players but generate negative surplus for themselves beyond this point	✓
Relevant	Will provide an objective measure to enable all stakeholders to assess whether outcomes of Act are likely to be worth the cost.	✓
Timebound	3-5 years	✓

Measurement of consumer surplus, approached in the way we have described (Section 2.2.2) is considered to be the prime economic benefit of casino development. In addition to player expenditure data, data collection on problem gambling at the local/regional level linked to casino gambling will be gathered through both the longitudinal and intercept studies and, at a national level, through the longitudinal module and the Gambling Commission prevalence study.¹⁵

6.1.2 Ancillary economic benefits from casino development

Objective: To measure the ancillary economic benefits of the 17 Gambling Act casinos		
Specific	To gambling benefit assessment	✓
Measurable	Series measuring key indicators of regeneration, renewal and regional development (the 3Rs)	✓
Achievable	Through local areas statistical monitoring and integrated health impact assessment	✓
Relevant	Will provide an objective measure to enable all stakeholders to assess whether outcomes of Act are likely to be worth the cost.	✓
Timebound	-1 to 4 years (pre-post implementation)	✓

These should include, but not be limited to, series measuring such items as population, employment, revenue from business rates (proxy for local activity), percent of land derelict (to pick up regeneration) and number of new VAT registrations (an indicator of the extent to which development fosters a culture of entrepreneurship). The LAS study should:

¹⁵ The prevalence study refers to the study currently being undertaken by the Gambling Commission and NatCen. We do not comment on this study further but assume that data will be publicly available from it. It is understood that the study will not measure the impact of the new casinos, however it will provide a reliable measure of problem gambling prevalence that can assist in calculating consumer surplus.

- Identify (in so far as is practicable), for each new casino area, at least one community that matches the study area on the basis of available local area statistics and general profile. Where possible, the match proposed should be in the same region to control for broad regional trends within the UK economy.
- Monitor movements in available statistical series from the year before announcement of sites of new casinos to and beyond their opening.
- Report for each new casino and its matching community/ies a comparison (with tests for statistical significance) in the movements of variables included in the study.
- Comment on inferences to be drawn from the findings and any contrasts in results as between the various new casino locations.

The collection of local area statistics will be managed through the Integrated Impact Assessment.

Existing data sources are only indicators and whilst some could be linked to particular policy objectives, for example regeneration, there arises the problem of how to weight the various impacts identified.

We have considered therefore whether there is some overall measure that will capture a range of benefits and costs to the community when a new casino is opened. The only one we consider it practicable to access is the value of real estate. This should capitalise the benefits (access to job and business opportunities and to additional leisure facilities, gaming or otherwise) and costs (any negative externalities such as increased crime). Identification of benefits and costs through examination of impact on property prices is a standard revealed preference technique (HM Treasury, 2003, p. 27). The theoretical requirements for the change in real estate values to measure benefits and costs in money terms are that the market is competitive and that buyers have full information on the amenities and disamenities associated with each property. The first is surely met in the UK housing market. The second might not be met if, for example, the study were focused on the costs of some invisible atmospheric pollutant; but the convenience of being able to dine out in a glitzy casino or the benefits of one's offspring having access to part-time work there or the traffic nuisance caused by visitors to the casino will all be readily apparent once the casinos are operating; and even less obvious possible consequences such as more burglaries are likely to reach public consciousness in time. We are therefore prepared to believe that property prices are a good place to look for an answer to how much, if at all, host communities benefit from casinos. It may, of course, be that changes in property prices are the result of some other community intervention or external cause and it will be necessary to monitor such developments where they occur.

While this approach has been exploited often in evaluating new facilities in transport, we are familiar with only two applications related to casinos. Buck et al (1991) examined the effect of the introduction of casinos in Atlantic City on residential property prices in 64 communities in the area. Consistent with the proposition that Atlantic City had benefited from the investment in gaming, property values were shown to have increased sharply. However, price growth increases were moderated in areas where crime had increased most since the

casinos arrived. This feature of their results encourages us to hope that house prices will respond to and reflect any negative, as well as positive, features of casinos. A more recent study by Wenz (2007) supports the use of housing markets as an impact indicator. Again in the US, it reports an average of 2% added to household values for property near to casinos with some evidence of positive spill over to neighbouring in state regions.

We therefore propose a significant study of the behaviour of property prices in casino and matched (as before) non-casino communities in the years before and subsequent to casino openings. The goal would be to estimate the change in the value of the housing stock associated with the introduction of a casino. It would be essential this time to study a case only if the match were in the same region because the dynamics of regional house prices in the UK would otherwise undermine the case for the data from the matching community providing a suitable control. We anticipate that largest effects would occur in smaller towns selected for a casino; but this merely reflects the reality that a new investment in a conurbation will have proportionally less impact on availability of jobs and it will be easier for residents with a distaste for gaming to find locations where the casino is far enough away not to discomfort them.

We further propose to augment understanding of the distribution of benefits and costs, that in a number of casino communities a hedonic price study be undertaken to establish impacts at varying distances from the casino. The exact location of the casino will not be randomly chosen and in some cases the selected site will be derelict with depressed property prices around. In such a case, biased results would follow from regressing house price on distance to the casino. Rather a pooled sample of pre- and post-casino sales would be obtained and house price regressed on a year dummy, distance to the casino and an interaction term equal to the product of the other two variables. The coefficient on the interaction term would then provide information on local impacts. Of course, a large number of control variables would need to be added and issues such as functional form considered. But these are standard considerations in hedonic price studies. Appropriate data on prices and property characteristics are available from the Land Registry or very rich data for large samples of transactions are purchasable from major mortgage lenders such as Halifax or Nationwide. These sources provide electronic records, which facilitate econometric analysis. Because they relate to realised market prices, they offer a more reliable basis for investigation than information collected from estate agents. The study should also consider the extra value that may be created in the stock of commercial property. Information on business rents would serve as an adequate proxy.

Finally, in both residential and commercial property calculations, care should be taken to include the value of additions to stock as well as changes in the value of the existing stock when measuring changes in aggregate worth in casino and matching communities.

The collection of property value data will be managed through the Integrated Impact Assessment. The local steering group for this study would have information on other possible reasons for changes in property values in their area and will be asked to submit this as part of the assessment.

6.1.3 Displacement

Objective: To measure the costs to other sections of the gambling industry		
Specific	To gambling cost-benefit assessment	✓
Measurable	Econometric analysis of figures on spending in the new casinos and information in existing data series (such as lottery sales, from the operator, and betting volumes, derived from Revenue and Customs returns on ‘gross profit’ (i.e. GGR))	✓
Achievable	Relies on existing data collection	✓
Relevant	Will provide an objective measure to enable all stakeholders to assess whether outcomes of Act are likely to be worth the cost.	✓
Timebound	3 to 4 years (post implementation)	✓

This study would require only econometric analysis of figures on spending in the new casinos and information in existing data series (such as lottery sales, from the operator, and betting volumes, derived from Revenue and Customs returns on ‘gross profit’ (i.e. GGR)) rather than new data collected in fresh fieldwork. The task would be less straightforward than in American and Australian states where panels of states provide more variability in the data; but estimation of equations that regress, for example, Lotto sales on casino GGR is feasible so long as the challenge of finding appropriate instruments for casino GGR is met. Results could be cross checked by analysis of data on regional and sub-regional lottery sales (preferably from the operator but possibly from the Food and Expenditure Survey) where one would expect to find different trends in lottery spending in areas with and without a new generation casino.¹⁶

Reliability of results would be likely to be high but would depend on how satisfactory instruments were judged to be. The issue is that if one regresses lotto sales on any measure of casino turnover, the coefficient estimate on casino sales cannot be interpreted as a causal impact from casinos to the lottery since the estimate may be contaminated by influences running in the opposite direction (for example a new lottery game may reduce takings at casinos). The standard econometric solution is to exploit a third variable which is exogenously determined but closely correlated with the variable of interest. Authors in the field have used, for example, casino admissions or tax rates or lagged values of casino turnover. Generally the issue is more easily resolved in federal settings. For example, casino tax rates will then be different in different states and this provides a variable which drives casino turnover but can viewed as exogenously determined. In the unitary fiscal setting of Great Britain, no variation is likely in the tax rate over short periods, so that this instrumental variable option will not apply. Other instruments will be possible but those looking to criticise results may focus on the partly subjective question of whether the instruments selected are truly exogenous.

¹⁶ Northern Ireland is of course a region where there will be neither casinos nor easy access to casinos. However, it provides a poor yardstick for comparison since it is atypical in its current take-up of UKNL products).

For this reason, it is desirable that results should be cross checked through a further study that would analyse data on regional and sub-regional lottery sales where one could test for trends in lottery spending in areas with different combinations of new and/or existing gambling opportunities and those without such opportunities. Such a study could employ data from the Food and Expenditure Survey but the limited sample size would dictate that the geographical areas defined would then be very wide and the tests would consequently be very blunt. A superior test would be based on data from the operator (whose co-operation would be critical) on sales over time at different retail outlets defined by postcode. Researchers familiar with geographical information system (GIS) software would treat sales at each location over time as panel data to be explained by socio economic characteristics of an area (revealed in information on Census 'output areas', of which there are some 175,000) and by distance to new and old (i.e. 1968 Act) casinos. Results would offer a refined measure of how accessibility of casino gaming impacts lottery sales. Further, they would throw light on which social groups were most likely to substitute casino gaming for spending on UKNL products. In principle, the same approach could be used to examine effects from machines outside casinos but the data on where such machines were located, and patterns of use, may be much harder to gather (as we have identified above).

Farrell and Forrest demonstrated that in Australia effects on lotto sales from legalisation of casino style gaming machines took time to build. Our judgement is that econometric analysis is unlikely to be capable of yielding formal estimates until three or four years after 2009. Immediate impacts of new casinos may of course be evident from raw data before then.

6.2 Crime

Objective: To measure the crime costs and benefits arising from implementation of the Gambling Act, 2005.		
Specific	To gambling cost-benefit assessment	✓
Measurable	Through offender and offences index, follow-up interviews with offenders, police spending, cross sectional survey (BCS) and community consultation	✓
Achievable	Relies largely on existing data collection and existing consultation processes	✓
Relevant	Will provide an objective measure to enable all stakeholders to assess whether outcomes of Act are likely to be worth the cost.	✓
Timebound	-1 to 4 years (pre-post implementation)	✓

Data on recorded crime could be obtained through the offender and offences index and analysed by area. Data on unreported crime could be obtained through the addition of a short module in the BCS and analysed according to area. Community perceptions of crime could be gathered through local area community policing consultation mechanisms such as PACT.

The challenge is identifying the link, if any, between crime (and certain forms of crime) and gambling and in particular the relationship between casino development and crime. This needs to be addressed through studies similar to Crofts (2003) that initially identify crimes previously associated with gambling (such as fraud, embezzlement, larceny domestic violence offences and so forth) through a crime index over a specified period of time (we would

propose 5 years beginning before the casinos are operational) and following up offenders to inquire further into their gambling behaviour and the links that they make with their offending behaviour and to track their offending careers over 5 years. The sample of crimes and offenders would also need to include some crimes not traditionally associated with gambling (e.g. traffic offences (excluding drink driving), abduction and others) to act as a control. Community perceptions can be assessed through initiatives such as PACT and the Integrated Impact Assessment. Although absolute certainty about links would not be achievable through this method it would provide important information about the way communities themselves understand the links between the casinos and crime. Unreported crime and links with gambling behaviour could be further probed through the addition of questions to the British Crime Survey. These would necessarily be kept to a minimum (possibly 3 at most) but could at least provide some data on the perception of victims, especially families, where most unreported crime is likely to occur.

Police spending has been found to increase or stay the same as comparator areas following casino developments, depending on size and average area (state) spend and thus data would need to be collected on the annual average spend on policing in casino areas and comparator areas.

Figure 7: Draft Framework for Measurement of Crime Impact of Gambling Act Casinos

Data Description	Regional	Large	Small
Population: e.g. age, gender, ethnicity, socio-economic & marital status	Census Regional demographic data Visitor data (regional)	Census Local area demographic data Visitor data (ward/county)	Census Local area demographic data Visitor data (ward/town)
Reported Crime	Offender Index Offences Index BCS	Offender Index Offences Index BCS	Offender Index Offences Index BCS
Unreported crime	BCS Community Policing Consultation (across region)	BCS Community Policing Consultation (across county)	BCS Community Policing Consultation (across ward/town)
Community Crime perceptions	Community Policing Consultation (across region)	Community Policing Consultation (across county)	Community Policing Consultation across ward/town)
Policing costs	Regional police data	County police data	Ward/town police data
Comparable development	Council planning survey (across region)	Council planning survey (across county)	Council planning survey (across surrounding wards)
Control	All above (comparator region)	All above (comparator county)	All above (comparator town)

Data for the crime study would be collected at a local level through the integrated impact assessment and at a national level through the offenders and offences index (with a follow up sample using telephone interviews) and the BCS. In addition crime relevant data will be collected through the longitudinal studies. These different sources of data will provide evidence of; changes in policing as a direct result of the casinos,

increases in crime related to the casinos as recorded by the police, community perceptions of crime linked to the casinos as recorded by the police, percentages of crimes linked to gambling reported and unreported. Triangulation of data with a repeat pre-post design will enable a reliable assessment of crime impacts related to gambling before and after the Gambling Act, 2005, casinos are established.

6.3 Public Health, Community and Cultural Life

It is recommended that any public health impact study carried out in the UK include:

- A prospective, longitudinal general population survey;
- Data collection at the community level including monitoring of appropriate area level public health indicator profile data (see Appendix 2 for examples of current available indicators identified as relevant) (Integrated Impact Assessment).

6.3.1 Prospective Longitudinal Survey

Objective: To measure the social, cultural and health costs and benefits arising from the Gambling Act, 2005, casinos.		
Specific	To gambling cost-benefit assessment and protection of the vulnerable	✓
Measurable	Through established and robust longitudinal study design	✓
Achievable	With appropriate investment	✓
Relevant	Will provide an objective measure of problem gambling and related negative impacts, indicators of positive impacts and data on causal and protective factors and processes, to enable all stakeholders to assess whether outcomes of Act are likely to be worth the cost. It will also inform the development of prevention and treatment services in public health.	✓
Timebound	-1 to 4 years (pre-post implementation)	✓

Longitudinal research has been identified as one of the critical basic research needs in the gambling studies field (Abbott et al, 2004; National Research Council, 1999). Longitudinal research is needed to clarify the role and relative importance of risk factors in the development of problem gambling. Of particular relevance are studies where representative general population samples are followed and the same individuals are re-assessed over time, preferably commencing before the onset of their gambling problems and examining subsequent transitions between phases of non-problem and problem gambling.

We are in agreement with Reith in her report to the Scottish Executive that the impacts of casinos need to be monitored through longitudinal surveys of a range of social and economic factors and with findings tested against control groups. In our view, a longitudinal design is the only means to obtain information about the rate of new occurrences of both non-problematic and problematic gambling in the population. A longitudinal design also affords the means to differentiate between impacts that arise as a result of involvement in casino

gambling and those related to other types of gambling in the environment or to predisposing factors at the individual level.

6.3.2 Longitudinal Sample Design

We gave careful consideration to two sampling approaches for a prospective longitudinal study of the impact of the new casinos in the UK. We fully agree with concerns that specific subgroups in the general population will be differentially affected by the introduction of casino gambling. Despite the substantial information that is available about such subgroups, it is not possible to accurately predict how certain demographic subgroups (e.g., young adults, older adults, women and cultural and ethnic minorities) will be affected. In our view, a better approach is to focus the sampling strategy on groups that are at high risk due to their involvement in already existing forms of gambling (and hence more likely to take up casino gambling) or, alternatively, groups that are at high risk due to their geographic location relative to the new casinos.

Increased gambling opportunities create more problem gamblers by increasing the risk of exposure. As more people gamble, the risks are greater that individuals with specific vulnerabilities will gamble and develop problems related to their gambling. Results from two cross-sectional national surveys in the US have shown that the location of a major gambling venue in a community is associated with rates of problem and pathological gambling that are approximately double the rates in communities without such venues (Gerstein et al, 1999; Welte et al, 2004). However, as Shaffer and Korn (2002) have pointed out, longitudinal research is required to determine if (a) the availability of new forms of gambling causes increases in prevalence, (b) casinos locate in areas with a disproportionately vulnerable population or with an already high rate of problem gambling, or (c) people with gambling problems are motivated to move to areas with new opportunities to gamble.

After extensive discussion, we have concluded that a stratified random sampling strategy based on geography is the preferred approach. Concurring with Williams and Stevens (2006), we also believe that a case-control design is necessary to provide for counterfactuals and assess the influence of possible mediating factors on the impacts of the new casinos.

Use of a stratified random sample means that there will be adequate representation of both the overall population and key subgroups in the population. Stratified random sampling also means that the study will include enough cases from each subgroup to allow for meaningful subgroup inferences (Trochim, 2000). Stratified sampling is appropriate because these subgroups vary considerably in the behaviours of interest. However, post-stratification weighting can be used to adjust the achieved sample to reflect the population as a whole.

In designing stratified samples, proportional allocation is generally used to determine the size of the sample in each stratum. Proportional allocation is generally preferable because it results in a self-weighting sample and makes it easier to generalize results to the entire population. However, in the present case, the goals are analytical rather than descriptive and it is therefore essential to include enough cases in subgroups of interest. This makes equal allocation across strata (or subgroups) a more appropriate sampling strategy.

Given variations across Great Britain, we believe it will be necessary to sample at least four small casinos and four large casinos. The sample can be recruited by means of random-digit-dialling (RDD) or, alternatively, by the use of area probability sampling techniques. The final

sample should consist of at least 8,000 individuals (aged 16 and over) living within 20 miles of the small casinos or the city centres of the small casino control cities and within 50 miles of the large casinos or the city centres of the large casino control cities. Half of the respondents in each of the small casino and control cities will reside within 10 miles of the casino or city centre; in the case of the large casino and control cities, half of the respondents will reside within 20 miles of the casino or city centre. Using this design, researchers will have 500 respondents in each locale available for analysis with half residing closer to the casino or city centre and half residing further away. If no major differences in impacts are discerned after several waves of data collection, it may be possible to aggregate the small casino and large casino samples and achieve greater analytic power.

Sampling for a regional casino will require a somewhat different approach compared with the large and small casinos. If a regional casino is located in a provincial city, we would recommend that the same approach developed for the small and large casinos be adopted, albeit with an overall sample size of 3,000 rather than 2,000 and with strata of within 5, 50 and 100 miles of the casino or city centre. If a regional casino is located in a destination resort, we would recommend a different sampling approach based on amount of time spent travelling to reach the casino (with strata of “less than 1 hour,” “1-2 hours” and “more than 2 hours”). The second option is preferable where only one regional casino in a country is agreed, since that casino will also act as a national resource.

We are aware of a significant number of new licences having been applied for under the 1968 Act (Collins (EIM) estimated these at over 100) which will, if granted, add significantly to the increase in machine gambling opportunities in the UK. Where these 1968 Act casinos are in 2005 Act casino areas, or their controls, their impacts (both positive and negative) will be covered. However, there may be a clustering of new casinos in permitted areas not covered by the areas sampled to assess the impact of the Gambling Act, 2005 casinos. We would therefore recommend extending the framework recommended above to include at least a sample of up to four permitted areas where new casinos are being established. The data collection methodology would remain the same, although the sample should be drawn from distances of 5 and 10 miles and be reduced to 125 for each condition, reflecting the smaller size, number of machines and customer base.

Figure 8: Proposed sampling strategy for a longitudinal study

New 68 Act casinos (n=1000)		Small casinos (n = 2000)		Large casinos (n = 2000)		Regional Casino (n=3000)	
Within 5 miles	4 x 125 = 500	Within 10 miles	4 x 250 = 1000	Within 20 miles	4 x 250 = 1000	<1hr	1 x 1000
Within 10 miles	4 x 125 = 500	Within 20 miles	4 x 250 = 1000	Within 50 miles	4 x 250 = 1000	1-2 hrs	1 x 1000
						>3hrs	1 x 1000
New 68 Act casinos control cities (n=1000)		Small casino control cities (n = 2000)		Large casino control cities (n = 2000)		Control = Module added to existing area specific longitudinal study e.g. ALSPAC	
Within 5 miles	4 x 125 = 500	Within 10 miles	4 x 250 = 1000	Within 20 miles	4 x 250 = 1000		
Within 10 miles	4 x 125 = 500	Within 20 miles	4 x 250 = 1000	Within 50 miles	4 x 250 = 1000		

Since this is a longitudinal study, we are proposing five waves of data collection at 12-month intervals. It will be essential to conduct the first wave of data collection prior to the opening of the casinos.

6.3.3 Panel Attrition

Longitudinal data provide dynamic information for modelling human behaviour and testing theories. However, attrition is a significant challenge in studies involving panel data. The survey literature is rich in information about attrition in panel surveys. The extent and determinants of panel attrition depend on the study design, data collection method, study topic, and many other factors. Panel attrition reduces the sample size over time and may lead to bias and increased variance in estimates of relationships between variables of interest.

The first line of defence against panel attrition is to design for non-response as a component of total survey design. One important measure for minimizing panel attrition is to obtain adequate locating information from eligible respondents. Another important measure for minimizing panel attrition is the use of incentives. We believe it will be essential to provide some form of incentive to respondents at the conclusion of each interview.

Despite best efforts, researchers should expect that approximately 10% of the panel will be lost at each wave of data collection. If the study consists of five waves of data collection, the final sample for the new '68 Act', small and large casinos (including controls) can be expected to be composed of just over 6,500 respondents including close to 130 problem and pathological gamblers (at an estimated prevalence rate of 2%¹⁷). The sample for the regional casino (n=3,000) loses 10% of respondents at each wave of data collection, the final sample will be composed of approximately 1970 respondents and would include nearly 40 problem and pathological gamblers if problem gambling remains constant at 2%.

6.3.4 Measures

Based on the studies reviewed, the prospective longitudinal survey should include assessments of the following:

- Gambling participation, intensity and expenditures;
- Attitudes to gambling including different modes, locations and levels of participation;
- Prevalence of problem and pathological gambling;
- Personal characteristics including age, gender, ethnicity, religion, education, work, parental and familial attitudes toward and involvement in gambling;
- Personal impacts, including satisfaction and enjoyment, social connectedness, alleviation of boredom, physical health, mental health and suicidality, stress, tobacco, alcohol and drug use;
- Family impacts, including relationship effects, separation and divorce, domestic violence and parenting;

¹⁷ This figure may need adjustment following publication of the Gambling Commission UK Gambling Prevalence Study.

- Work and employment impacts, including income, changes in productivity, absenteeism, loss or gaining of job, receiving welfare, housing and unemployment benefits;
- Financial impacts, including increase or loss of household income, indebtedness and bankruptcy;
- Legal impacts, including arrests for gambling-related crime, court proceedings and incarceration; and
- Help seeking for gambling problems by individuals with problems or others known to them;
- Co-morbidity with alcohol, drugs and mental illness;
- Social capital and quality of life measures.

6.3.5 Longitudinal Module

Objective: To measure gambling behaviour and attitudes and the social, cultural and health costs and benefits arising from implementation of the Gambling Act, 2005, outside the Gambling Act casinos (Internet, machines, bingo, betting etc)		
Specific	To gambling cost-benefit assessment and protection of the vulnerable	✓
Measurable	Through established and robust longitudinal study design (UKHLS)	✓
Achievable	With appropriate investment (cost of module attached to UKHLS)	✓
Relevant	Will provide an objective measure of problem gambling and related negative impacts, indicators of positive impacts and data on causal and protective factors and processes, to enable all stakeholders to assess whether outcomes of Act are likely to be worth the cost. It will also inform the development of prevention and treatment services in public health.	✓
Timebound	-1 to 4 years (pre-post implementation)	✓

In order to test for impacts of gambling outside the Gambling Act 2005 casinos, a gambling screen (such as a shortened version of the Canadian Problem Gambling Severity Index (PGSI) as used in other surveys) could be applied to the UKHLS. A sample of 500 non-problem gamblers, 250 at risk gamblers and 250 problem gamblers would be followed through five waves of data collection at three points over 5 years. Respondents would only be sampled from areas outside those covered by the longitudinal survey. The design of follow up interviews would match that of the longitudinal survey in casino areas.

6.3.6 Intercept Study

Objective: To measure problem gambling correlated with the Gambling Act casinos to assist in more accurate determination of consumer surplus,
 To recruit a substantial number of regular, frequent casino gamblers who will provide additional information about the impacts of casinos on heavier gamblers
 To monitor change in youth access and attitudes to gambling

Specific	To gambling cost-benefit assessment and protection of the vulnerable and youth	✓
Measurable	Through application of validated attitudinal and problem gambling scales	✓
Achievable	With appropriate investment	✓
Relevant	Will assist in determination of consumer surplus, will provide additional information about the impacts of casinos on heavier gamblers and will assist in evaluation of the effectiveness of the Act in relation to protection of children and young people.	✓
Timebound	1 to 4 years (post implementation)	✓

We anticipate that the prospective, longitudinal survey will yield a relatively small number of cases of problem and pathological gambling. We are proposing that an additional intercept study be conducted to accomplish two goals—first, to assist in determination of consumer surplus and, second, to recruit a substantial number of regular, frequent casino gamblers who will provide additional information about the impacts of casinos on heavier gamblers. This approach builds on the study undertaken in the US by the National Opinion Research Center (Gerstein et al, 1999).

We recommend that a sample of 500 visitors be interviewed at each of the four small casinos and four large casinos and that a sample of 2,000 visitors be interviewed at the regional casino. The questionnaire should include a reduced set of the questions included in the prospective longitudinal survey. Respondents should be randomly intercepted (e.g., every 8th or 10th person) as they enter or exit the casino and invited to participate in the study. This will permit assessments of the response rate for the study to be calculated. Data collection should be rotated to cover all periods of the day and evening and all days of the week. In order to take account of the ‘flow’ of problem gamblers in and out of the problem gambling cycle it will be necessary to repeat this survey annually.

In order to test the impact of regulations concerning the separation of adult gaming areas from those accessible by children and young people, we propose a Youth Access and Attitudes module in the intercept study. This module would extend the Casino Intercept study, following a similar design, but would be located within a sample of Family Entertainment Centres and leisure or recreational areas adjacent to casinos. Both young people (n=500) and parents (n=250) would be interviewed (with consent) about their gaming/gambling behaviour and attitudes in these two types of settings.

If care is taken in the design of the intercept study, it should be possible to use the “dual-frame” sampling approach to combine the samples and re-weight the resulting larger file to accurately reflect their proportions in the general population. This will improve the overall precision of estimates of consumer surplus as well as of impacts of gambling problems from the prospective, longitudinal study.

6.3.7 Impacts of new gaming technologies

Objective: To develop methods for measuring the impact of new machine gaming technologies on gambling behaviour and problem gambling in adults, children and young people		
Specific	To the development of regulations on machine gaming and protection of the vulnerable and youth	✓
Measurable	Through application of methods applied in Australia and Canada	✓
Achievable	With appropriate investment and industry co-operation	✓
Relevant	Within a public health approach, will provide data on the 'agent' and ways in which machines can be modified and employed to reduce the risk of problem gambling	✓
Timebound	1 to 4 years (post implementation)	✓

Research that monitors and assesses the impact of variations in the situation, features and technical specifications of machines both inside and outside casinos should be a clear component of a Gambling Impact Assessment Framework informed by a public health approach. We therefore propose a player tracking feasibility and pilot study to more accurately assess changes in gambling behaviour (including problem gambling) linked to machines (both inside and outside casinos) and the Internet.

We have noted that the monitoring of machines inside casinos such as in Australia and New Zealand should be the approach taken to impact assessment data collection. However, the Gambling Commission consultation found that some of the technical specifications it is considering to impose on gaming machines maybe too expensive for operators to implement and some of these may be related to online monitoring and player tracking technologies. An estimated cost for conversion of machines for online monitoring is approximately £55 per machine (Bunkle, personal communication). In Australia and New Zealand some of the smaller operators found the cost prohibitive and this may be the case in venues outside the casinos in Britain. We therefore propose that for the purpose of monitoring machines and their impact on player behaviour outside casinos consideration should be given to piloting a replication of the Nova Scotia Player Tracking Study.

This study has only just reported (February, 2007), although it has been in progress for several years. The length of time between planning, piloting and roll out is significant to the present impact assessment, demonstrating the technical, ethical and commercial complexities that are not insurmountable but that need careful negotiation.

There were several aspects to the study and here we focus on two: the player card research project (Omnifacts Bristol Research, 2007) and the VLT Player Tracking System (Schellinck & Schrans, 2007). The design for the first study involved several different sources of data collection; Card data extracted from the card system play data, 'compliant panelists' (those who played on a regular basis on the 'test' machines only without sharing their cards), a wider panel of card holders, users of VLTs not all of whom were card holders, a local 'general public' sample, and participants in focus groups which included some of these groups and in addition, owners of facilities and machines. These data sources are summarised in Figure 9.

The study was conducted in 4 stages. Stage 1, a usability study, piloted and tested the card system at 10 sites with 120 pre-recruited players. Stage 2 made modifications to the card system based on the findings of the usability study. In stage 3 all players in the selected area were issued with a card and required to use it on the VLTs, although they were not required to use the card's features. This stage also involved a full ethical review. Stage 4 involved analysing data from the various data sources and reporting. The primary aim of the project was to establish and evaluate a card based responsible gaming programme. Whilst responsible gaming features are entirely within the precautionary principle of the Act and these may be an additional feature to such a study, we anticipate the main aim of a UK player tracking study would be to pilot card based systems as a method for assessing the impact of new machine gaming opportunities on gambling behaviour more generally. Despite its focus on responsible gaming, we consider that the design of the Nova Scotia study does provide a workable template for assessing gambling machine impacts in the UK. The first phase would involve establishing industry/operator and player compliance and setting up the system in selected sites agreed with operators.

In the VLT player tracker system, the design also depended on card use, but the gaming unit was linked to a centralized database that recorded specified play activity for each card session and monitored system functions. The Nova Scotia study recorded information for approximately 40 variables including: **system variables** (e.g. account id, device id), **session characteristics** (e.g. date, time of day); **behavioural variables** (e.g. money put in, money cashed out); **outcome variables** (e.g. money won-lost, games won-lost), and; **use of RG features** (e.g. viewed account summary information for current session or over time (day, month, year), set a money limit for play, self-excluded for a set period). The final database represented all play information for a six month period (Schellinck & Schrans, 2007, pii).

Figure 9: Data Sources for the VLT Player Card Research Project (Source: Omnifacts Bristol Research, 2007, p14)

Data Set	Number of Records (n)	Source	Description
<i>Play Data for All Valid Cards</i>	1081	Card-system play data	Play Data for cards enrolled prior to Jan 1, 2006 that were not deemed to be "outliers" with very low or very high activity
<i>Compliant Panelist Play Data</i>	88	Card-system play data	Research panelists with limited (or no) card sharing, regular play outside the test area, or playing when the card-system/features were unavailable
<i>Panelist Survey Results</i>	Up to 137	Panel Surveys	Survey results for research panelists who completed surveys; 137 completed Panel Survey #1 (also known as Baseline Survey), 123 completed Panel Survey #2, and 131 completed Panel Survey #3
<i>Non-Panelist Survey Results (#1 and #2)</i>	Up to 90 and 69	Intercept Surveys	Results for intercept surveys completed with non-panelist VL players in Windsor and Mount Uniacke; Not all respondents were card-holders
<i>General Public</i>	Up to 400	General Public Survey	Results for respondents to a general public survey conducted in Windsor and Mount Uniacke including both VL and non-VL players (panelists were not screened out)
<i>Focus Group Results</i>	Not applicable; Qualitative in nature	Focus Groups	Feedback from focus group participants (44 participants in total)

6.3.8 Measuring the Impacts of Internet Gambling

Objective: To develop methods for measuring the impact of new internet gaming technologies on gambling behaviour and problem gambling in adults, children and young people		
Specific	To the development of regulations on internet gaming and protection of the vulnerable and youth	✓
Measurable	Through data collected by operators	✓
Achievable	With appropriate investment and industry co-operation	✓
Relevant	Within a public health approach, will provide data on the 'agent' and ways in which gaming can be modified and employed to reduce the risk of problem gambling	✓
Timebound	1 to 4 years (post implementation)	✓

In many jurisdictions, such as Malta and the Cayman Islands, records of Internet gambling transactions are passed to the regulator on a daily basis. There is no practical or technological reason why this data should not be made available in an anonymised form to allow for research. Similar ethical and commercial considerations exist as with the land based machine derived data, however.

Gamblers' individual records are stored and analysed by casino companies as part of their market analysis; 'know your customer' data is integral to their business. This player information is not currently handed to regulators unless there is an investigation into money laundering or some other crime. Such information is regarded as commercially sensitive, but there is no reason in principle why it should not be required to be passed in an anonymised form to one or more bona fide researchers as a condition of licence. We recommend that commercial interests are protected and that an industry group could be usefully convened to address such issues during research project design and the project's lifetime.

The prior existence of this data means that there is no additional cost in data gathering; the main costs being for analysis and dissemination. In order to carry out such a study in the UK a considerable amount of co-operation between industry, regulator and public stakeholders would be involved. If the study was time limited and designed to meet data protection and ethical requirements, we consider this co-operation may be possible in selected areas. The government may like to consider whether co-operation with government sanctioned research should be a default condition of the 2005 Act. If providing this data for research was a licence requirement then it is simply a cost of doing business for all participants in the gambling market. There would be concern by operators that their competitors could gain access to data which would yield commercially sensitive results so the databases will have to be made functionally anonymous.

We have balanced the inherent methodological difficulties with a tracking study (technological capacity, costs associated with technological compliance, ethics and commercial sensitivity) with the need to monitor the impacts of changes in machine gambling on gambling behaviour and problem gambling. At this stage we consider that a feasibility study should be carried out, involving industry operators from all relevant sectors and

consumers, with the aim of designing a pilot tracking study which has the co-operation of all involved. As technology advances, costs reduce and trust relationships develop within clearly defined ethical parameters, such a study may be more broadly applied to the sector.

6.3.9 Youth Gambling

Objective: To develop methods for measuring the impact of the Gambling Act, 2005 on children and young people		
Specific	Focus on young people and gambling behaviour	✓
Measurable	Through an extension of existing survey techniques	✓
Achievable	With appropriate investment and co-operation of the NLC	✓
Relevant	To the principles of the Act, particularly protection of the vulnerable and youth	✓
Timebound	2 – 3 years post implementation	✓

With respect to youth gambling we recommend a variation in design of the NLC youth gambling study to enable assessment of i) any increases in gambling (legal, illegal, casino related, internet) and ii) changes in the rate of problem gambling in youth (linked to other forms of gambling and not just fruit machines and lottery products) following implementation of the Gambling Act in 2007 and the development of new gambling opportunities. In order to assess the key issue of whether changes in regulation have led to an increase in youth problem gambling (or a significant change in youth gambling behaviour) it would be appropriate to assess this once the Act has been fully implemented and new gambling opportunities have been in existence for at least 12 months. Thus, we suggest that amendments to the NLC to test for changes in youth gambling as a consequence of the Gambling Act provisions would most usefully be conducted in 2 - 3 years time.

In addition to the more quantitative data obtained from the NLC study, and in order to test the impact of regulations concerning the separation of adult gaming areas from those accessible by children and young people, we propose a Youth Access and Attitudes Study (see Intercept Study above). This study would extend the Casino Intercept study, following a similar design, but would be located within a sample of Family Entertainment Centres and leisure or recreational areas adjacent to casinos. Both young people and their parents would be interviewed (with consent) about their gaming/gambling behaviour and attitudes in these two types of settings.

A key question concerns the nature of early gambling behaviour and its relationship to problem gambling behaviour in adulthood, particularly in relation to vulnerability to new gambling opportunities emerging as a consequence of the Act and also more general global developments in machine and Internet gambling which the Act responds to.

With additional funding, national coverage could be obtained by adding a module to an ongoing longitudinal study such as the *Longitudinal Study of Young People in England* (LSYPE), also known as *Next Steps*, commissioned by the Department for Education and Skills (DfES) providing baseline prevalence data and allowing for assessment of changing trends with legislative change. There is little doubt that gambling and wagering remains a popular activity amongst children and young people yet little research has been conducted

focussing upon youth gambling behaviour in general, or on positive, protective factors the UK position on youth gambling may have (does allowing access in family entertainment centres in the context of family leisure protect against later gambling problems, for example?). There is a need to identify behavioural, risk and protective factors in relation to the development of problem gambling in youth (and related co-morbid addictive behaviours) which can be done most reliably through a longitudinal design. Such a study could also identify statistical relationships with other problematic behaviours such as youth crime, school exclusion and anti-social behaviour. It could also probe the relationship between video gaming machine play, computer game playing and the excessive use of gaming machines or internet gambling.

6.3.10 Community Level Data Collection

Objective: To measure the ancillary economic, social, cultural and health costs and benefits of the 17 Gambling Act casinos		
Specific	To gambling cost benefit assessment	✓
Measurable	Series measuring key indicators of regeneration, renewal and regional development (the 3Rs)	✓
Achievable	Through local areas statistical monitoring and integrated health impact assessment	✓
Relevant	Will provide an objective measure to enable all stakeholders (particularly communities and regions) to assess whether outcomes of Act are likely to be worth the cost.	✓
Timebound	-1 to 4 years (pre-post implementation)	✓

Health impact assessment is now a firmly established methodology for Public Health in the UK and is routinely applied in consideration of new developments including regeneration initiatives, transport developments, new buildings and facilities and the re-organisation of public health services. A recent evaluation found that the benefits of HIA outweighed the costs (York Health Economics Consortium, 2006) but that several process issues emerged that impacted on costs. A concern expressed about HIAs is that they are not integrated into other forms of impact assessment (SIA, EIA) or, conversely SIAs and EIAs fail to integrate health. Thus, there are recommendations for greater co-ordination between impact assessments at the local level and for the methodology of HIA to be extended to an Integrated Impact Assessment building on existing multi-agency partnerships (such as LSPs). There are a considerable number of data available at the local level, particularly in relation to regeneration which could be accessed in a casino HIA. For example, in relation to New Deal for Communities in the West Midlands, Parry and Judge (2005) note that they use a mixed-method approach to evaluate the health impacts of NDC initiatives involving the monitoring of trends in health indicators (e.g. accident rates, hospital admission statistics) measured in the NDC areas and a series of control populations that are compared over time. They also collect data through ‘focus groups with local residents, photographic records, interviews with health care professionals working in the NDC areas and analyses of local, regional and national print media’ p626-628

We consider that the most cost effective strategy to assess proximal impacts in the communities in which the new casinos will be located would be to draw on and build on such initiatives. An excellent method for addressing external economic impacts, public health,

community, cultural life and crime impacts at the local level for all 17 of the Gambling Act 2005 casinos would be to fund Integrated Impact Assessments at the public health (PCT) or Local Strategic Partnership (LSP) area level (depending on location). Such IIAs would have the added benefit of encouraging community ownership of the impacts and lead to action plans to minimize harms and maximise benefits that could be implemented, monitored and evaluated.

For the purposes of the wider impact assessment these IIAs would need co-ordination. The York report found variation and disparities in the application and resourcing of HIA's across regions. Scotland and Wales both have a co-ordinating body (Scottish HIA network and WHIASU) but in England support is mainly offered through public health observatories. Thus, depending on where the casinos are located, there will be a greater or lesser need for additional (funded) co-ordination of the impact assessment process.

There is general agreement about the stages of Health Impact Assessment (see Figure 10). This scoping exercise has, in effect, completed stage 1 and made a significant contribution to stages 2 (scoping) and 3 (assessment) of an HIA framework. Thus local teams comprised of multi-agency professionals could draw on the scoping exercise (the module reports and databases) and would, as their contribution to stages 2 and 3, consider how to apply it when undertaking an HIA in their area. This would involve identifying and considering the range of evidence either available or collectable with co-operation in the relevant locality including changes in:

- Police Activity
- Crime rates
- Crimes linked to gambling
- Crime locations or 'hot spots'
- Community perceptions of crime linked to the casinos (would require police co-operation but all 4 could be part of a PACT type initiative)
- Suicides (Police/Coroner)
- Divorce (Family Court data)
- Data on debt including, helpseeking for Debt (CAB), house repossessions, debt related prosecutions
- Child protection referral rates by category (LA Social Care)
- Domestic Violence rates (Refuge/Police)
- Number and type of jobs created or lost
- Investment in local infrastructure
- Property values
- Referrals to Mental Health services (Heath Trusts)
- Referrals to drug and alcohol services (Health Trusts)
- Youth offending rates (YOT teams)
- Attendance and attainment rates for children and young people (Children's Services)
- Public Health dataset indicators (Public Health)
- Availability of gambling related services (Health Trust, GamCare/BreakEven)
- Uptake and outcomes of gambling related services (Health Trust, GamCare/BreakEven)

Some of the likely impacts of the new casinos may not be best assessed through surveys, whether cross-sectional or longitudinal, but rather through time-series analyses of crime and

welfare data. An IIA could incorporate this data collection at a local/regional level. Data requirements for agent characteristics will require a focus on the following characteristics:

- accessibility (advertising, visibility)
- availability (e.g. number of outlets, opening times, membership or entry requirements)
- area location characteristics
- perceived safety of the setting
- association with other attractions
- whether or not alcohol is available
- technology
- structural features of games, and
- host responsibility programmes.

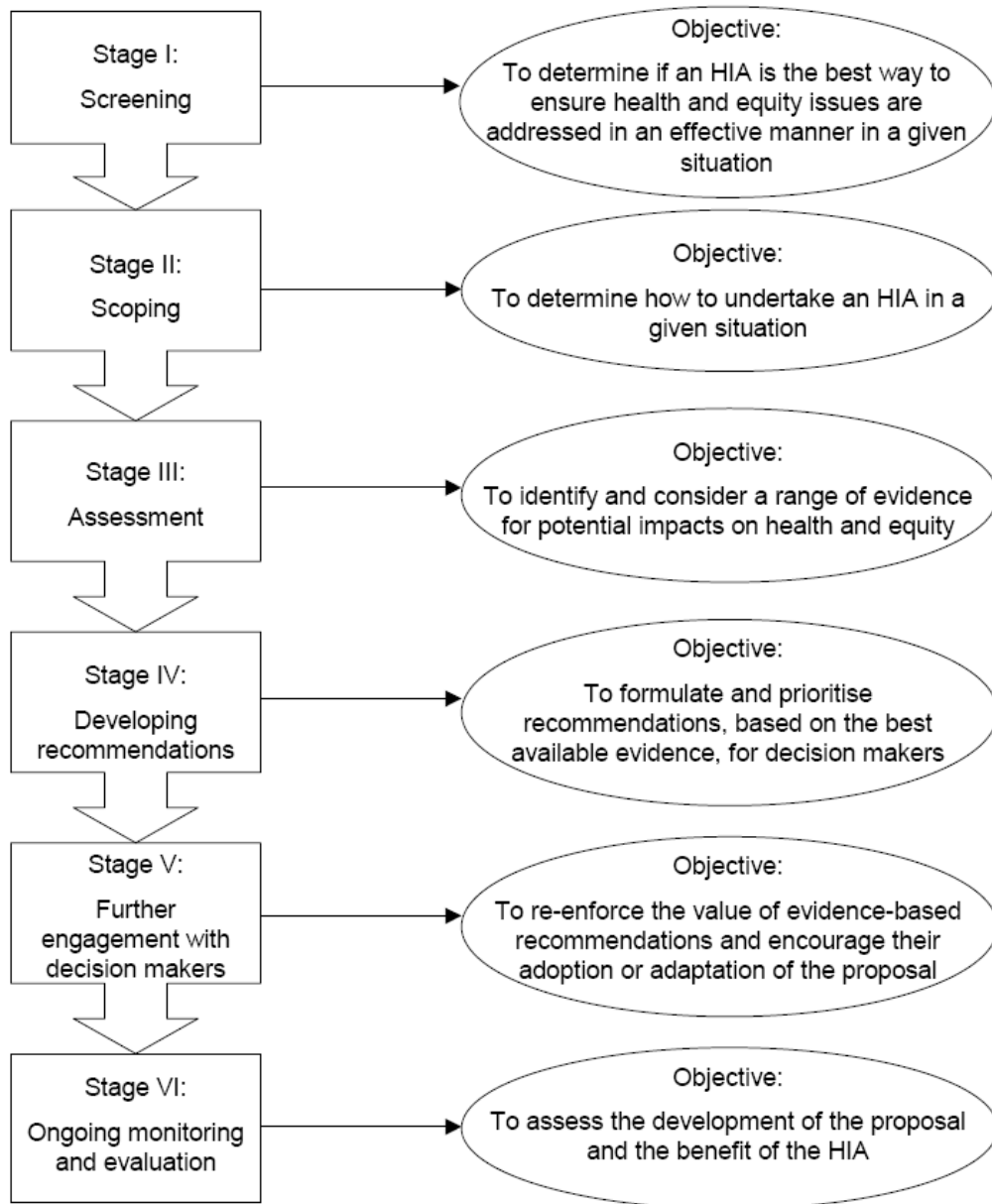
Each of these factors can be collected through the integrated impact assessment. Each agency would be represented on the IIA partnership (likely to be a sub-group of the Local Strategic Partnership) and could establish mechanisms to flag gambling related information. Assessment could then be made on the basis of local knowledge as to how far these changes (if any) were linked to the Gambling Act 2005 casinos. In addition the impact assessment should review the availability of local area statistics (LAS) relevant to economic impact. These should include, but not be limited to, series measuring such items as population, employment, revenue from business rates (proxy for local activity), percent of land derelict (to pick up regeneration) and number of new VAT registrations (an indicator of the extent to which development fosters a culture of entrepreneurship). The IIA should:

- Monitor movements in available statistical series from the year before announcement of sites of new casinos to and beyond their opening on an annual basis;
- Report for each new casino and its matching community/ies a comparison (with tests for statistical significance) in the movements of variables included in the study.
- Comment on inferences to be drawn from the findings and any contrasts in results as between the various new casino locations.

9 matched control areas should be identified (4 small, 4 large, 1 regional), comprised of at least one community that matches the study area on the basis of available local area statistics and general profile. Where possible, the match proposed should be in the same region to control for broad regional trends within the UK economy. The methodology in the matched control areas would be the same and would offer the additional benefit of assessing the impact of other new gambling opportunities available in the UK including Internet gambling as well as raising awareness of local partnerships to gambling more generally.

In addition to the co-operation of local strategic partnerships (or similar) to refine and possibly extend their current data collection of local area statistics, the IIA will require research support and co-ordination. We anticipate this will involve the FTE of at least 2 researchers over 3 years and associated administration and management costs.

Figure 10: Health Impact Assessment



Source: Adapted from HDA. Introducing health impact assessment (HIA): Informing the decision-making process. Edited by Taylor L and Blair-Stevens C. 2002.

CHAPTER 7: ETHICS, SKILLS AND ARCHIVING

Research governance has developed considerably over the last 10 years, with the introduction of the Dept. of Health Research Governance Framework and the implementation of various research ethics frameworks by research councils, including the Economic and Social Research Council in 2006.

This means that any research conducted by Universities will be subject to a standardised and rigorous ethical review process. Research conducted outside Universities by consultants and market research companies is generally covered by the Market Research Society's Code of Conduct. We consider each of the Framework studies in turn, although many of the issues overlap.

7.1 Longitudinal Studies

The main ethical problems that can be expected to arise in relation to a longitudinal study are: Use of incentives; effects on vulnerable people; breaches of confidentiality and uses of data collected.

7.1.1 Use of incentives

It is crucial for the longitudinal study that response rates remain at a level sufficient for reliability of statistical inference. Incentives are increasingly used to ensure that attrition is kept to a minimum and participation to a maximum. Incentives can range from tokens to cash. Researchers must make a judgement about incentives which involves balancing the need for sufficiently representative participation against the danger of recruiting a group of quasi-professional survey respondents. The latter can lead to an unreliable self-selected sample or payment for a particular pattern of response.

The survey topic of gambling brings an added danger in that this may mean that people use the money they are given to gamble. This, in itself is not necessarily ethically problematic but does become so where people have a problem associated with gambling. In the longitudinal module this will be the case for the follow up sample and will also apply to a small minority in the wider longitudinal survey. It may be avoided through the use of generic gift voucher but in our experience there is always the possibility that such vouchers are exchanged for cash in informal arrangements. However, it might be that the value of the voucher will not be sufficient to make a difference to someone gambling at problematic levels, who are likely to be spending much more than the vouchers worth on a regular basis.

7.1.2 Effects on vulnerable people

We consider the main issue relating to vulnerability in the case of any of the studies involving interview questions about gambling behaviour to be the possibility that talking about gambling could be precipitate a relapse for problem gamblers.

Guidelines and survey specific training would help counteract this difficulty. Training should include basic awareness of problem gambling and its consequences and guidelines should include reference to a helpline or online source of support for problem gambling. The

guidelines should also be drawn up with a therapeutic agency, such as GamCare who will direct interviewers on appropriate methods to help them anticipate whether this will be an issue for a respondent and thus direct them for help. It is known that many types of exposure can trigger a relapse (even watching a TV programme) so a research interview might also be an opportunity to assist those in this position.

7.1.3 Breaches of confidentiality

It may be that interviewers identify a number of related conditions that are harmful and known to co-exist with gambling disorders. These include:

- undiagnosed mental illness;
- undiagnosed problem or pathological gambling;
- criminal behaviour;
- family violence; and
- possible suicide

If the study is conducted by a research organisation outside government the organisation should be bound by ethical codes of conduct. In the case of universities, all should now have a research ethics framework which meets the requirements of the ESRC and the Department of Health (Research Governance Framework). Agents who are members of the Market Research Society are bound by the Society's Code of Conduct. In both instances the anonymity of the research subjects will be protected, although this can be breached under the terms of the Data Protection Act if it is discovered that a crime has been committed or an individual's life is at risk.

It is generally the case that research participants are informed of this under the conditions of informed consent and therefore can choose not to disclose such information. Researchers are not trained to diagnose mental illness or problem gambling so it would be unwise to take such an observation as any more than informal speculation. Where there are concerns, the same guidelines operating in the case of vulnerability should apply. Where a serious crime has been committed or where someone's life is at risk and this is made known to the researcher under the conditions of informed consent it will be necessary for the researcher to report this information. Clear channels of communication for reporting should be established at the beginning of the project.

7.2 Uses of Data

DCMS currently takes the position that research data should be made available to researchers, generally through depositing the data at the ESRC archive (Essex University). We consider that there could be considerable added value achieved to the investment involved in the Framework by opening data sets for secondary analysis. However, this is not without difficulties as some of the data will be sensitive and each data set will need to undergo a careful access assessment and disclosure analysis prior to making it more widely available.

7.2.1 ESRC Archiving

All the data collected through the UK Gambling Impact Assessment Framework is potentially available for archiving with the ESRC. The process of submitting data is fairly simple and details can be found (along with the data submission form) at <http://www.esds.ac.uk/aandp/create/depintro.asp>. We consider that there are two main issues in relation to archiving: ensuring that all research subjects are aware that the data could be used (in an anonymised form) for secondary analysis by anyone accessing the ESDS, and related to this, ensuring that all data is effectively anonymised prior to deposit. The former can be dealt with at the consent stage of a project. The latter is more complex and we recommend that before any data is submitted it is subject to disclosure analysis.

7.2.2 Disclosure Analysis (Source: Dean Gerstein, personal communication, March 2006)

The basic scenario in disclosure analysis is the following: An entity with unwelcome intentions -- an invader -- has acquired the public use data file (PUF). The invader knows with assurance that a certain person was a respondent. The invader also knows a certain amount of public or quasi-public information, and perhaps also some private but less sensitive information, about the respondent. The invader, for whatever ultimate purpose, is now determined to find that person's record in the PUF and thus uncover confidential, sensitive information that was collected in the interview -- violating the survey's promise of confidentiality and lack of harm.

In operational terms, the disclosure analyst's objective is to develop specifications for producing the PUF that will thwart the invader's intentions. As in most security plans, the goal is to make the invader's task difficult, unattractive, and risky, not necessarily to provide totally unbreachable protection.

The first assumption must be that the invader's target could be *anyone* in the data set. *All* records must be protected. Second, for the invader to be certain that he or she -- or some computational tool or "bot" -- has found the right record based on all the information the invader already knows, he/she/it must be able to deductively reduce the maximum number of eligible records that could be the target respondent to no more than 2. So long as 3 or more records could be the target, as best the invader can narrow it down, the PUF is considered diligently protected from deductive disclosure.

The disclosure analyst may employ a variety of protective measures as needed; in particular, the analyst may mask or erase data in order to protect individual identities. For example, the analyst may (1) recode variables into more inclusive response categories to make more respondents look alike, (2) set the values of certain variables for some respondents to "missing" so some respondents are more difficult to see, and (3) change the values of certain variables for some respondents, systematically or randomly -- giving them, in effect, a fake ID. Since these measures will be applied to respondents who fall into minority (i.e. N= less than 3) these procedures should not compromise the overall validity of large scale data sets.

The first step is to anticipate what the invader could already know. The standard minimum assumption is that the invader knows the target respondent's age, sex, race, marital status, and residence address. These are the primary disclosure variables (PDVs). Basically, one wants

to be certain that *any* combination of all possible PUF values of the PDV's will have at least three records that have that same combination.

The second step is to decide how the PDV's should be reported in the PUF? Sex is generally a simple dichotomy. Race is usually coded according to the census categories but there may be further required or expected breakouts. Small groups generally pose the biggest risks of disclosure. Age is virtually always recoded into five- or ten-year intervals or into somewhat uneven categories such as 18-25, 26-35, 36-45, 46-55, 56-65, 65 and older. Marital status has conventional categories of single, married, separated, divorced, and widower/ed – or more compactly, married, formerly married, and never married. Address is generally folded into geographic aggregates such as demarcated regions (post code areas, wards, counties) or some form of disjoint size/density classes, for example: large metro/small metro/rural area, or central cities/suburbs/rural. Generally, one starts by setting up a provisional set of recodes for the PUF, and then revisiting these codes and other protective strategies after the third step.

The third step involves running the multi-way cross-tab of the PDVs and inspecting cell frequencies—identifying where there are small cells. It helps to have an automated routine for this that cruises through the many cross-tab cells and flags all with fewer than a threshold number of cases. The threshold should be higher than the minimum of 3, e.g., 10 cases or more per cell.

The PDVs are then revised accordingly, using the tools of masking and/or gone-missing, until the third step shows up clean of any too-small cell counts.

A fifth step involves looking for additional variables that an invader might have, such as employment information, household composition, number of children, etc. – and add these ways to the cross-tab. Steps two to four are then repeated. As a move is made from the PDVs to these secondary disclosive values, it becomes more acceptable to alter individual records rather than make wholesale reclassifications to mask a few vulnerable cases.

Finally, the results are documented in two forms, one highly specific for internal use only in developing the PUF, and a second more general one to include with the PUF, which is meant to discourage invaders and avoids giving them any clues that could help reverse the protective actions.

Some of the data to be obtained will be potentially sensitive and open to exploitation from companies with commercial interests and thus it may be necessary to qualify the 'general access rule'. We discussed limiting access to the data archived with ESRC and consider this could be an option if access were restricted by research proposal and a requirement to disclose any outputs from the research involving secondary analysis of data. However, whilst this might discourage unethical practices it would not prevent the most unscrupulous from gaining access for their own ends. We concluded that with effective anonymising procedures the benefits of making the data available for secondary research would outweigh the risks but that this would need to be reviewed on a project by project basis when archiving is applied for.

7.3 Additional Ethics Considerations

Longitudinal Module: UKHLS will be bound by its own ethics approval procedures. The follow up sample will be subject to the additional issues already identified by the longitudinal study above and should be addressed in a similar way.

Intercept Adult & Youth Gambling Attitudes and Behaviour: We consider there to be 3 main issues here. In relation to the casino intercept study, it may be that interviewers encounter people who are distressed, perhaps because they have lost more money than they can afford, or who do not wish to be identified in the casino. All respondents should be made aware that they do not need to participate in the interview if they do not wish. Interviewers will be advised not to approach any individual who is obviously distressed. However, if someone becomes distressed during the interview we advise a protocol should be followed which has been agreed in advance with the casino concerned. The interview should be immediately terminated and the individual could be directed to speak with a casino employee trained under their responsible gambling programme, and additionally should be supplied with the contact details for an organisation such as GamCare.

In the youth gambling survey consent to participate should be obtained from both a parent/carer and the child themselves. If either do not consent the interview should not take place.

Integrated Impact Assessment: The IIA largely comprises of secondary data analysis, however the design allows for data gaps to be identified and new data to be collected where necessary. All the IIAs will be covered by Health Trust areas and include an element of health impact assessment. We therefore propose that the IIA is subject to ethical approval by the local health research ethics committee, which will request that any changes or developments in design are agreed with the it before implementation.

Crime Impact Study: This study involves the secondary analysis of existing data and follow up interviews. Thus all the ethical issues identified for the longitudinal study are relevant to this study and would require the same approach.

Counter Factual Avon: The ALSPAC study has its own Ethics and Law Committee and the additional module would be subject to its own ethical scrutiny. It is likely that they will consider the same issues as those already identified in relation to the longitudinal study (above).

Consumer Surplus: This study will only involve secondary analysis of data and we do not anticipate any additional ethical issues.

Displacement: This study will only involve secondary analysis of data and we do not anticipate any additional ethical issues. Clearly, the study may have some commercial interest which would mean that confidentiality and data protection principles would need to be adhered to at all times.

Player-Gambling Tracking Feasibility Study: A number of ethical issues can be anticipated. It should be made clear to people using the gambling facility (machine or internet

site) that information is collected about them, what the information contains and how it will be used. Where such information is currently being collected this should already be made known to the player. If the information is to be used for research and this is not already stated, this should additionally be made known. Reassurances could be given that information collected may be used for research (as it is currently by many operators) and that there will be no possibility of individuals being identified, that Data Protection Act principles will be adhered to and that individuals have the right to withhold their information for research purposes if they so choose.

Players recruited to the pilot study (machines outside casinos) would be fully informed about the research and asked to sign a consent form. We consider that it would be necessary to make clear that there will be no attempt to judge individual player behaviour (as problematic or risky) or to intervene in their behaviour during the lifetime of the project. Aggregate assessments of player behaviour type may be made, however. Similarly, data obtained through machine monitoring in casinos and game monitoring on internet sites would not be used to identify individual player behaviour, or intervene in that behaviour for the purposes of research. This would not prevent or impact upon casino and site operators from continuing their responsible gambling programmes and making interventions as they would do under normal circumstances. Research participants should be aware of their right to refuse to participate or withdraw from the investigation whenever and for whatever reason they wish.

We recommend that, in line with replicating the Nova Scotia design, the feasibility study includes a separate module on ethical review to be conducted by a Gambling Assessment Framework standing committee (see below).

Youth Gambling: The National Lottery Commission has been running this survey for several years and we assume it has the necessary ethical clearance although no mention of this is made in the reports. The survey in 2006 was carried out by MORI who are bound by the Market Research Society's Code of Conduct.

7.4 An Ethics Standing Committee

The ethical issues involved in the UK Gambling Impact Assessment Framework point to the need for an overarching ethical body for the framework (as is the case with the ALSPAC study for example, and the Nova Scotia player tracking studies) which includes representatives from the DCMS, ESRC and ethics specialists. This would not reduce the need to follow related codes of practice or conduct relevant to Universities or Market Research Society members, but would ensure that ethical issues are addressed as an ongoing concern with specific reference to expertise in the field and the needs of various stakeholders, such as government, players, the gambling industry and treatment providers, which may differ in some respects.

7.5 Skills

The skills required to implement the UK Gambling Impact Assessment Framework are broadly those offered by any competent research organisation. The longitudinal study, de facto, requires considerable resources and a minimum 5 year commitment. The organisation responsible should have trained interviewers, good data analysis facilities and high standards for dissemination at all levels. This would apply to all the studies under consideration. The

exception is the Integrated Health Impact Assessment which we anticipate will require skilled research support and co-ordination but which also depends on the co-operation and involvement of stakeholders at the community level.

CONCLUSION

The list of factors explored in this report and accounted for within the Gambling Impact Assessment Framework recommended include:

- Changes in gambling behaviour, particularly problem gambling (longitudinal study, integrated impact assessment, intercept);
- Any associated changes in alcohol, and other substance dependency (longitudinal study, integrated impact assessment);
- Social harms arising such as increased family violence, homelessness, crime, bankruptcy, etc (longitudinal study, integrated impact assessment; crime study);
- Whether or not attitudes to gambling and other activities are affected (longitudinal study, integrated impact assessment, intercept);
- Effects on social cohesion, participation and life chances (longitudinal study, integrated impact assessment; crime study);
- The effectiveness of interventions which reduce harms and increase benefits of Gambling Act Casinos (longitudinal study, integrated impact assessment);
- Changes to incomes, employment and investment trends net of any diversion from other parts of the economy (longitudinal study, integrated impact assessment, consumer surplus study);
- Consumer Surplus, measurement of consumption benefits from the provision of new facilities (longitudinal study, integrated impact assessment, intercept study, consumer surplus study);
- Changes in expenditure on other forms of gambling and other forms of consumption expenditure (longitudinal study; intercept study);
- Effects on other industries such as tourism and the horse industry (integrated impact assessment);
- Whether or not these effects are confined to particular segments of the population or particular locations within Great Britain (longitudinal study, integrated impact assessment both through matched controls, intercept study);
- Any other benefits (health, social, economic, community or otherwise) of the Casinos development (not incurred as a result of intervention and not covered by the changes mentioned above) (longitudinal study, integrated impact assessment; intercept study);

b) In each case, an assessment was made against the following criteria:

- Number of studies required;
- Data requirements;
- Likely overall accuracy that can be attained together with any biases that may be involved,
- Timescales within which results can be produced,
- Costs likely to be incurred,
- Management resources required to ensure the continuity and consistency necessary to obtain comparability of results across all casinos

- How the different aspects of impact assessment can most economically be applied in the context of existing data collection requirements on local authorities and community organisations (such as health);
- Degree of reliance on the co-operation of different stakeholders for data collection and the extent to which compliance or non-compliance will alter study design.

Consideration of the range of gambling impact research that has been carried out internationally suggests several common themes. First, every jurisdiction is unique and any impact study must be designed to answer, as comprehensively as possible, the questions deemed most important by the policy makers and citizens of that jurisdiction. Second, care must be taken to take account of the socioeconomic impacts of *all* of the different types of gambling available in a jurisdiction, rather than focusing narrowly on the Gambling Act 2005 casinos, not least because of the recent planned expansion of the 1968 Act casinos. Third, it is impossible to fully account for *all* of the social benefits or costs associated with gambling since some impacts defy quantification but it is feasible to collect data on such impacts using a variety of methodologies. Fourth, the relationship between gambling availability and the prevalence of problem gambling is poorly understood although clinical and survey research suggest that there is a substantial lag between the introduction of a new form of gambling and the emergence of new problem gamblers in a jurisdiction. This suggests the importance of conducting regular and ongoing research into the impacts of legal gambling in any given jurisdiction. Fifth, much of the research is very problem focused and relatively little is still known about the range of gambling behaviour and benefits that might accrue from investment in the development of new gambling opportunities.

In our view, a model gambling monitoring system must include three basic elements. The first element is a *basic research effort* that would include a variety of projects generating information to inform both policy analysis and service development. There are several particularly critical basic research needs in the gambling field including longitudinal research on groups of people over time to improve our understanding of how gambling problems develop, how and when people with gambling problems and their families seek help and data on the effectiveness of that help. The second is an *integrated database* that co-ordinates and builds on existing and new information about gambling participation, expenditures and attitudes, gambling problems and other related data such as helpline calls, availability and effectiveness of services and positive impacts particularly in relation to regeneration. It is essential that this integrated database be kept up-to-date, theoretically and methodologically, both to reflect changing conceptions of gambling and new technologies and to incorporate new research data from other studies. The third critical element to any such system is a process for *dissemination* so that responses to new developments or information can be made quickly.

The options we have set out at the beginning of this report are the findings of the scoping study and we will not repeat them here. Next steps will depend on a willingness to fund the various studies recommended with an understanding of the holistic nature of the framework.

REFERENCES

- Abbott, D.A. & Cramer, S. (1993) Gambling attitudes and participation: A Midwestern survey. *Journal of Gambling Studies* 9 (3) pp 247-263
- Abbott, M.W. & Volberg, R.A. (1999) *Gambling and problem gambling in the community: An international overview and critique*. Wellington: Department of Internal Affairs
- Abbott, M.W. & Volberg, R.A. (2000) *Taking the pulse on gambling and problem gambling in New Zealand: Phase One of the 1999 National Prevalence Survey*. Wellington: Department of Internal Affairs, in association with Statistics New Zealand
- Abbott, M.W. & Volberg, R.A. (2006) The measurement of adult problem and pathological gambling. *International Gambling Studies* 6 (2) pp 175-200
- Abbott, M. W. & McKenna, B.G. (2005) Gambling and Problem Gambling Among Recently Sentenced Women in New Zealand Prisons. *Journal of Gambling Studies*, 21 (4) pp 559-581
- Abbott, M.W., McKenna, B.G. & Giles, L.C. (2005) Gambling and problem gambling among recently sentenced male prisoners in four New Zealand prisons. *Journal of Gambling Studies* 21 (4) pp 537-558
- Abbott, M.W., Volberg, R.A., Bellringer, M. & Reith, G. (2004). *A Review of Research on Aspects of Problem Gambling*. London: Responsibility in Gambling Trust
- Albanese, J. (1999) *Casino Gambling and White Collar Crime: An Examination of the Empirical Evidence*, prepared for the American Gaming Association
http://www.americangaming.org/assets/files/studies/white_collar_crime.pdf
- Amey, B. (2001) *People's participation in and attitudes to gaming, 1985-2000: Final results of the 2000 survey*. Wellington: Department of Internal Affairs
- Anders, G. and Siegel, D. (1998) An Economic Impact of Substitution Between Arizona Indian Casinos and the State Lottery *Gaming Law Review* 2 pp 609-613
- Annenberg Public Policy Centre (2006) *Card Playing Trend in Young People Starts to Diverge*,
http://www.annenbergpublicpolicycenter.org/Downloads/Releases/Release_iGamble20061002/Report_iGamble_20061002.pdf
- Australian Productivity Commission (1999) *Australia's Gambling Industries*, Report No. 10, Canberra: AusInfo
- Azmier, J.J. (2000) *Canadian Gambling Behaviour and Attitudes: Summary Report*. Calgary: Canada West Foundation
- Balci Y.G. & Ayranci U. (2005) Physical violence against women: evaluation of women assaulted by spouses. *Journal of Clinical Forensic Medicine* 12 (5) pp 258-63
- Baxandall, P. and Sacerdote, B. (2005) *Betting the Future: The Economic Impact of Legalized Gambling*. Policy Brief: Respectively Rappaport Institute for Greater Boston and Dartmouth College

- Bland, R.C., Newman, S.C., Orn, H. & Stebelsky, G. (1993) Epidemiology of pathological gambling in Edmonton *Canadian Journal of Psychiatry* 38 pp 108-112
- Borrell, J. & Boulet, J. (2005) A theoretical exploration of culture and community health: Implications for prevention, research, and problem gambling, *Journal of Gambling Issues* 13 <http://www.camh.net/egambling/archive/pdf/JGI-issue13/JGI-Issue13-borrell.pdf>
- Bowling, A. and Z. Gabriel (2003) An integrational model of quality of life in older age. Results from the ESRC/MRC HSRC quality of life survey in Britain, *Social Indicators Research* 69, pp 1–36
- Braithwaite, J. (1989) *Crime, Shame and Reintegration*. New York: Cambridge University Press.
- Braithwaite, J. (1985) White collar crime. *Annual Review of Sociology* 11 pp 1-25
- BMA Board of Science (2007) *Gambling Addiction and its Treatment Within the NHS: A guide for healthcare professionals*. London: British Medical Association
- Brown, R. & Fisher, S. (1996) *The Social Implications of Casino Gambling*. London: The Home Office.
- Brown, R. & Raeburn, J. (2001) *Gambling, harm and health: Two perspectives on ways to minimise harm and maximise health with regard to gambling in New Zealand*. Technical report, Problem Gambling Committee
- Browne, B. (1989) Going on tilt: Frequent poker players and control. *Journal of Gambling Behavior* 5 pp 3-21
- Bruce, A. & Johnson, J. (1994) Male and female betting behaviour: New perspectives. *Journal of Gambling Studies* 10 (2) pp 183-198
- Buck, A.J., Deutsch, J., Hakim, S., Spiegel, U., Weinblatt, J., (1991) A Von Thünen Model of Crime, Casinos and Property Values in New Jersey. *Urban Studies*, 28, pp 673-686
- Casswell, S., McPherson, M.J., Asiasiga, L., Barnes, H.M., Edwards, S., Easton, B., Guttenbeil-Po'uhila, Y. (2006) *Socio-economic impacts of gambling: Developing a methodology for assessing the socio-economic impacts of gambling in New Zealand*. Auckland: Centre for Health and Social Outcomes Research and Evaluation and Te Ropu Whariki.
- Centre for Gambling Research (2003) *Gambling and Clients of ACT Corrections: Final Report*, Australian National University
- Chang, S. (1996) Impact of casinos on crime: the case of Biloxi, Mississippi. *Journal of Criminal Justice*, 24, 5, pp 431-436
- Clarke, R., Dempsey, G., Chuin Nee, O., O'Conner, R. (1998) *The Technical Feasibility of Regulating Gambling on the Internet*, presented at the Conference on 'Gambling, Technology & Society: Regulatory Challenges for the 21st Century', Sydney, May
- Collins, D. and Lapsley, H., (2000) *The Social Costs and Benefits of Gambling. An Introduction of the Economic Issues*, 1st International Symposium on the Economic and Social Impact of Gambling, Whistler, British Columbia

Commission on the Review of the National Policy Toward Gambling (1976) *Gambling in America*. Washington, DC: Government Printing Office.

Conlisk, J. (1996) The utility of gambling. *Journal of Risk and Uncertainty*, 6, pp255-275

Courtney, K. (2002) Unattended Children in Casinos—Whose Responsibility? *Gaming Law Review*, 6, 2, pp 101 -106

Creigh-Tyte, S., & Lepper, J., 2004, *Survey of Participation in, and Attitudes towards, Gambling: Key Findings from the 2004 NOP Survey*.
www.culture.gov.uk/global/publications/archive_2004/research_survey_NOP_gambling.htm-40k-8

Crane, Y. (2006) *New Casinos in the United Kingdom: Costs, Benefits and Other Considerations*, Ph.D. thesis (University of Salford).

Crockford, D. & el-Guebaly, N. (1998) Psychiatric comorbidity in pathological gambling: a critical review. *Canadian Journal of Psychiatry*, 43, pp 43-50

Crofts, J. (2003) *Researching the Link Between Gambling and Crime*, Paper presented at the Evaluation in Crime and Justice: Trends and Methods Conference convened by the Australian Institute of Criminology in conjunction with the Australian Bureau of Statistics, Canberra, 24-25 March.

Daffern, P. & Mehdyzadeh, H. (2004) *The White Book: DCMS Guidance on Appraisal and Evaluation of Projects, Programmes and Policies* (with assistance from John Lepper and Stephen Creigh-Tyte), Technical Paper No. 10 Economics Branch, DCMS
<http://www.culture.gov.uk/NR/rdonlyres/773CCC77-5EA4-4C89-BF9C-7750FE127690/0/WhiteBookforweb.pdf>

Darbyshire, P., Oster, C. & Carrig, H. (2001) The experience of pervasive loss: Children and young people living in a family where parental gambling is a problem. *Journal of Gambling Studies*, 17, 1, pp 23-45

Department for Communities and Local Government (2006) *Assessing the Impact of Spatial Interventions*, accessed at
http://www.communities.gov.uk/pub/302/Assessingtheimpactofspatialinterventions_id150730_2.pdf

DCPC, Parliament Victoria (2002) *Inquiry into Motor Vehicle Theft: Final Report*, Parliament of Victoria: Drugs and Crime Prevention Committee (1999 – 2002) by Authority Government Printer for the State of Victoria

Dickerson, M., Haw, J. & Shepherd, L. (2003) *The psychological causes of problem gambling: A longitudinal study of at risk recreational EGM players*. Sydney: University of Western Sydney, School of Psychology, Bankstown Campus. <http://www.dgr.nsw.gov.au>.

Dickson, V., James, E., Kippen, S. (2005) The experience of living with a problem gambler: Spouses and partners speak out. *Journal of Gambling Issues* 13,
<http://www.camh.net/egambling/>

Dowling, N., Smith, D., Trang, T (2005) Electronic gaming machines: are they the ‘crack-cocaine’ of gambling? *Addiction* 100 (1), pp 33–45

- Drake, S. & Cayton, H. (1945) *Black metropolis*. New York: Harcourt Brace & Co.
- Eadington, W. (1999) The Economics of Casino Gambling, *Journal of Economic Perspectives*, 13, 3, pp 173-192
- Eadington, W. & Christenson, I. (2004) *The Future of the Casino Industry: Strategic Considerations in Light of Changing Economic Conditions*. Working paper, University of Nevada, Reno.
- Economopoulos, A. (2006) Opposing the lottery in the United States: Forces behind individual attitudes towards legislation in 1975. *International Gambling Studies*, 6, 2, pp 237-291
- Elliott, D. & Navin, J. (2002) Has Riverboat Gambling Reduced State Lottery Revenue? *Public Finance Review*, 30, pp 235-247
- Europe Economics (2006) *Fixed Odds Betting Terminals, the Code of Practice and problem gambling. A second report for the Association of British Bookmakers Limited*, London: Europe Economics
- Evans, W. & Topoleski, J. (2002) *The Social and Economic Impact of Native American Casinos*. NBER Working Paper W9198
- Farrell, L. & Forrest, D. (2005) *Measuring Displacement Effects Across Gaming Products: A Study of Australian Gambling Markets*, working paper, University of Salford.
- Farrell, L. & Walker, I. (1999) The Welfare Effects of Lotto: Evidence from the UK', *Journal of Public Economics*, 72, pp 99-120
- Fink, S. & Rork, J. (2003) The Importance of Self-Selection in Casino Cannibalization of State Lotteries, *Economics Bulletin*, 8, 10, pp 1-8
- Finckenauer, J. & Chin, K. (2006) *Asian Transnational Organized Crime and Its Impact on the United States: Developing a Transnational Crime Research Agenda*, Rockville: National Criminal Justice Reference Service <http://www.ncjrs.gov/pdffiles1/nij/grants/213310.pdf>
- Fisher, S. (1993). The pull of the fruit machine: A sociological typology of young players. *Sociological Review* 41, 3, pp 446-475
- Fisher, S. & Griffiths, M. (1995) Current trends in slot machine gambling: Research and policy issues. *Journal of Gambling Studies*, 11, 3 pp 239-247
- Focal Research (1998) *Novia Scotia video lottery players' survey 1997-9*, Halifax: Novia Scotia Department of Health, Problem Gambling Services
- Gallup Organization (1999) *Gambling in America: Topline and trends*. Princeton, N.J. <http://www.gallup.com/poll/socialaudits/gambling2.asp>.
- Gazel, R., Rickman, D., Thompson, W. (2001) Casino gambling and crime: A panel study of Wisconsin counties, *Managerial and Decision Economics*, 22, 1-3, pp 65-76
- Gerstein, D., Volberg, R., Toce, M., Harwood, H., Palmer, A., Johnson, R., Larison, C., Chuchro, L., Buie, T., Engelman, L., Hill, M. (1999) *Gambling impact and behavior study: Report to the National Gambling Impact Study Commission*. Chicago, IL: National Opinion Research Center at the University of Chicago

<http://cloud9.norc.uchicago.edu/dlib/ngis.htm>

Giacopassi, D., Nichols, M., Stitt, B. (1999) Attitudes of Community Leaders in New Casino Jurisdictions Regarding Casino Gambling's Effects on Crime and Quality of Life. *Journal of Gambling Studies*, 15, 2 pp 123-147

Glantz, S., Wilson-Loots R. (2003) No association of smoke-free ordinances with profits from bingo and charitable games in Massachusetts, *Tobacco Control*, 12, 4, pp 411-3

Goodale, J. (1987) Gambling is hard work: Card playing in Tiwi society, *Oceania*, 58, 1, pp 6-21

Giffiths, M. (1990) Arcade clientele and gaming preferences: A long-term study, *Perceptual and Motor Skills*, 70, p 1258

Griffiths, M. (1993) Factors in problem adolescent fruit machine gambling: results of a small postal survey. *Journal of Gambling Studies*, 9, pp 31-45

Griffiths, M. (1999) Gambling Technologies: Prospects for Problem Gambling. *Journal of Gambling Studies*, 15, 3 pp 265-283

Griffiths, M. (2004) Betting your life on it, *British Medical Journal*, 329 pp1055-6

Griffiths, M., Parke, A. and Parke, J. (2005) Gambling-Related Violence: An Issue for the Police? *The Police Journal*, 78, 3, pp 223-227

Grinols, E. & Mustard, D. (2006) Casinos, Crime and Community Costs, *Review of Economics and Statistics*, 88, pp 28-45

Griswold, M. & Nichols, M. (2006) Social capital and casino gambling in U.S. communities. *Social Indicators Research*, 77, 3, pp 369-394

Hancock, L. (2006) *Peer Review of Europe Economics: Fixed Odds Betting Terminals and the Code of Practice: Round 2 Research: A Report for the Association of British Bookmakers Ltd.* London: DCMS

http://www.culture.gov.uk/Reference_library/Publications/archive_2006/betting.htm

Hayano, D. (1989) Like eating money: Card playing in a Papua New Guinea Highlands village, *Journal of Gambling Behavior*, 5, 3, pp 231-245

Hegarty, K., Hindmarsh, E., Gilles, M. (2000) Domestic violence in Australia: definition, prevalence and nature of presentation in clinical practice, *The Medical Journal of Australia*, 173 pp 363-367

Henslin, J. (1967) Craps and magic. *American Journal of Sociology*, 73, pp 316-330

HM Treasury (2003) *The Green Book: Appraisal and Evaluation in Central Government*, 3rd ed., London: TSO Books

Hoyle, R. (2000) Personality Processes and Problem Behaviour, *Journal of Personality*, 68, 6, pp 953-966

Hunter, E. & Spargo, R. (1988) What's the big deal? Aboriginal gambling in the Kimberley region, *The Medical Journal of Australia*, 149, 11-12, pp 668-672

- Innes, M. and Fielding, N. (2002) 'From Community to Communicative Policing: 'Signal Crimes' and the Problem of Public Reassurance', *Sociological Research Online*, 7(2), www.socresonline.org.uk
- Isaranurug S, Nitirat P, Chauytong P, Wongarsa C. (2001) Factors relating to the aggressive behavior of primary caregiver toward a child, *Journal of the Medical Association Thailand*, 84, 10, pp 1481-9
- Jabin, N. (2006) *International discussions around frameworks and strategies*, internal discussion paper, London: Responsibility in Gambling Trust
- Jacobs, D. (2000) Juvenile gambling in North America: An analysis of long term trends and future prospects, *Journal of Gambling Studies*, 16, 2, pp 119-152
- James O., Chin, K. (2004) *Asian Transnational Organized Crime and its Impact on the United States: Developing a Transnational Crime Research Agenda*, Report submitted to the National Institute of Justice, USA
- Johnson, S. (1985) Kin and casinos: Changing family networks in Atlantic City. *Current Anthropology*, 26, pp 397-399
- Kallick, M., Suits, D. Dielman, T. & Hybels, J. (1976) *Survey of American gambling attitudes and behavior: Final report to the Commission on the Review of the National Policy Toward Gambling*. Ann Arbor: Survey Research Center, Institute for Social Research
- Kearney, M. (2005) The Economic Winners and Losers of Legalized Gambling, *National Tax Journal*, 57, pp 281-302
- Korn, D. & Shaffer, H. (1999) Gambling and the health of the public: Adopting a public health perspective. *Journal of Gambling Studies*, 15, 4, pp 289-365
- Korn, D., Gibbins, R., Azmier, J. (2003) Framing public policy towards a public health paradigm for gambling. *Journal of Gambling Studies*, 19, 2, pp 235-256
- Kwan, F. (2004) Gambling attitudes and gambling behavior of residents of Macao: The Monte Carlo of the Orient. *Journal of Travel Research*, 42, 3, pp 271-278
- Lalander, P. (2006) Swedish machine gamblers from an ethnographic perspective. *Journal of Gambling Issues*, 18, <http://www.camh.net/egambling/>
- Lesieur, H. (1993) Female pathological gamblers and crime. In: Eadington, W. & Cornelius, J. eds. *Gambling Behavior and Problem Gambling*, pp. 495–515. Reno, NV: Institute for the Study of Gambling and Commercial Gaming, University of Nevada.
- Lesieur, H. (1998) Costs and treatment of pathological gambling, *Annals of the American Academy of Political and Social Science*, 556, pp 153-171
- Lesieur, H. & Anderson, C. (1995) *Results of a survey of Gamblers Anonymous Members in Illinois*, Park Ridge, IL: Illinois Council on Problem and Compulsive Gambling
- Light, I. (1977) Numbers gambling among Blacks: A financial institution, *American Sociological Review*, 42, pp 892-904

- Livingstone, C., Woolley, R., Borrell, J. (2006) *The Changing Electronic Gaming machine (EGM) Industry and Technology*, Office of Gaming and Racing, Victorian Government Department of Justice, Melbourne, Victoria, Australia, June 2006 www.justice.vic.gov.au
- Masterman-Smith, H., Martin, S., McMillen, J. (2001) *Social and Economic Impacts of Gambling in New Zealand* (Australian Institute for Gambling Research (AIGR), [http://www.dia.govt.nz/Pubforms.nsf/URL/Social&EconomicImpacts.pdf/\\$file/Social&EconomicImpacts.pdf](http://www.dia.govt.nz/Pubforms.nsf/URL/Social&EconomicImpacts.pdf/$file/Social&EconomicImpacts.pdf))
- Marx, A., (2002) *Gambling Changes in Great Britain: Proposed Changes, Possible Outcomes*, M.Sc. thesis, University of Nevada, Reno
- McGowan, V., Droessler, J., Nixon, G., Grimshaw, M. (2000) *Recent research in the socio-cultural domain of gaming and gambling: An annotated bibliography and critical overview*. Edmonton, AB: Alberta Gaming Research Institute <https://dspace.ucalgary.ca/>
- McMillen, J. & Doran, B. (2006) Problem Gambling and Gaming Machine Density: Socio-spatial Analysis of Three Victorian Localities. *International Gambling Studies*, 6, 1, pp 5-29
- McMillen, J. & Woolley, R. (1998) *Report on Gambling Regulatory Regimes*, Independent Pricing and Regulatory Tribunal
- McMillen, J. & Woolley, R. (2000) Money laundering in Australian casinos, Proceedings of the 3rd *Gambling Regulation Conference*, Australian Institute for Criminology, Canberra
- McMullan, J. & Perrier, (2003) Technologies of Crime: The Cyber-Attacks on Electronic Gambling Machines. *Canadian Journal of Criminology and Criminal Justice*, 45, 2 pp 159-186
- Mandel L., Alamar B., Glantz, S., (2005) Smoke-free law did not affect revenue from gaming in Delaware. *Tobacco Control*, 14, 1, pp 10–2
- Moodie, C & Finnigan, F. (2006) *Prevalence and Correlates of Youth Gambling In Scotland* *Addiction Research & Theory*, 14, 4 pp 365 - 385
- Morasco, B., Pietrzak, R., Blanco, C., Grant, B., Hasin, D., Petry, N. (2006) Health problems and medical utilization associated with gambling disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions, *Psychosomatic Medicine*, 68, 6, pp 976-984
- Muelleman, R., DenOtter, T., Wadman, M., Tran, T., Anderson, J. (2002) Problem gambling in the partner of the emergency department patient as a risk factor for intimate partner violence, *Journal of Emergency Medicine*, 23, 3, pp 307-12
- National Lottery Commission, Griffiths, M. & Wood, R. (2006) *Under 16s and the National Lottery*. London: NLC
- National Opinion Research Center (1999) *Gambling Impact and Behavior Study*. <http://cloud9.norc.uchicago.edu/dlib/ngis.htm>
- National Research Council (1999) *Pathological gambling: A critical review*, Washington, DC: National Academy Press
- Nichols, M., Stitt, B., Giacomassi, D., (2002) Community assessment of the effects of casinos on quality of life, *Social Indicators Research*, 57, 3, pp 229-262

- Nichols, M., Stitt, B., Giacomassi, D. (2004) Changes in suicide and divorce in new casino jurisdictions, *Journal of Gambling Studies*, 20, 4, pp 391-404
- Nickerson, N. (1995) Tourism and gambling content analysis, *Annals of Tourism Research*, 22, 1, pp 53-66
- Nuffield, J. & Hann, R. (2000) *Casino Impact Study: Brant County*, Ontario Problem Gambling Research Centre
- Omnifacts Bristol Research (2007) *Nova Scotia Player Card Research Project*. Halifax: Nova Scotia Gaming Corp
- Orford, J., Sproston, K., Erens, B., White, C., Mitchell, L. (2003) *Gambling and problem gambling in Britain*. Hove: Brunner-Routledge
- Ortiz, J. & Corcoran, S. (2004) *California's Gaming Propositions: How has the expansion of gaming rights affected local communities?* California State University, Sacramento
- Parry, J & Judge, K, (2005) Tackling the Wider Determinants of Health Disparities in England: A Model for Evaluating the New Deal for Communities Regeneration Initiative, *American Journal of Public Health*, 95, 4, 626-628
- Paton, D., Siegel, D., Vaughan Williams, L., (2003) The Demand for Gambling, in Vaughan Williams, L. (ed.), *The Economics of Gambling*, London: Routledge
- Pavalko, R.M. (1999). A case study of a casino campaign: Testing the Dombink-Thompson model. *Journal of Gambling Studies* 15 (3) pp 247-264
- Pearson, J. Simmill-Binning, C., Paylor, I (2005) Lancashire *Constabulary National Reassurance Policing Project*, Lancaster University Unpublished Final Research Report
- Peltzer, K. & Thole, J. (2000) Gambling attitudes among Black South African university students. *Psychological Reports*, 86, pp 957-962
- Petry, N., Stinson, F., Grant, B. (2005) Comorbidity of DSM-IV Pathological Gambling and Other Psychiatric Disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions, *Journal of Clinical Psychiatry*, 66, 5, pp 564-574
- Phipps, A. (2004) Crime and disorder, and house sales and prices around the casino sites in Windsor, Ontario, Canada, *Canadian geographer*, 48, 4, pp 403-432
- Pion Economics (2005) *Casinos in England's Northwest: An Assessment of Market Demand*. Final Report
- Piscitelli, F & Albanese, J. (2000) Do Casinos Attract Criminals? *Journal of Contemporary Criminal Justice*, 16, 4, pp 445-456
- Polzin, P., Baldrige, J., Doyle, D., Sylvester, J., Volberg, R., Moore, W. (1998a) Final report to the Montana Gambling Study Commission. In *The 1998 Montana gambling study: A report to the Governor and the 56th Legislature*, Montana Gambling Study Commission. Helena, MT: Montana Legislative Services Division

- Polzin, P., Baldrige, J., Doyle, D., Sylvester, J., Volberg, R., Moore, W. (1998b) From Convenience Stores to Casinos: Gambling – Montana Style, *Montana Business Quarterly*, 36, 4, pp 2-14
- Productivity Commission. (1999) *Australia's gambling industries, Report No. 10*. Canberra: AusInfo. Available at <http://www.pc.gov.au/>.
- Putnam, R (2000) *Bowling Alone: The Collapse and Revival of the American Community*, Simon and Schuster, New York.
- Reith, G. with the Scottish Centre for Social Research (ScotCen) (2006) *Research on the Social Impacts of Gambling: Final Report*. Edinburgh: The Scottish Executive
- Reith, G. (2006) *Peer Review of Europe Economics: Fixed Odds Betting Terminals and the Code of Practice: Round 2 Research: A Report for the Association of British Bookmakers Ltd*. London: DCMS
http://www.culture.gov.uk/Reference_library/Publications/archive_2006/betting.htm
- Rosecrance, J. (1985) The next best thing: A study of problem gambling. *International Journal of the Addictions*, 20, pp 1727-1740
- Rosenthal, R. & Fong, T. (2004) *The etiology of pathological gambling*, Report to the California Office of Problem Gambling
- Rubinstein, R. (1987) The changing context of card playing on Malo, Vanuatu, *Oceania*, 58, 1, pp 47-59
- RSe Consulting (2006) *A Literature Review and Survey of Statistical Sources on Remote Gambling*. London: DCMS http://www.culture.gov.uk/NR/rdonlyres/E0A395C1-35CC-4717-BF00-B1F6BD3A6B76/0/RemoteGambling_RSeReport.pdf
- Ryan, T. & Speyrer, J. (1999) *Gambling in Louisiana: A benefit/cost analysis*, Baton Rouge, LA: Louisiana Gaming Control Board
- Sakurai, Y. & Smith, R. (2003) *Gambling as a Motivation for the Commission of Financial Crime*, Trends and Issues in Crime and Criminal Justice, No 256, Australian Institute of Criminology
- Saunders, D. & Turner, D. (1987) Gambling and leisure: The case of racing. *Leisure Studies*, 6, 3, pp 281-299
- Schellinck, T. & Schrans, T. (2007) *Assessment of the Behavioral Impact of Responsible Gaming Device (RGD) Features: Analysis of Nova Scotia Player-card Data - Windsor Trial*. Halifax: Focal Research Consultancy
- Sexton, L. (1987) The social construction of card playing among the Daulo. *Oceania*, 58, 1, pp 38-46
- Shaffer, H. & Korn, D. (2002) Gambling and related mental disorders: A public health analysis, *Annual Review of Public Health*, 23, pp 171-212
- Shaffer HJ, LaBrie RA, LaPlante DA, Nelson SE, Stanton MV (2004) The Road Less Travelled: Moving From Distribution to Determinants in the Study of Gambling Epidemiology. *Canadian Journal of Psychiatry*, 49, 8 pp 504-516

- Smith, G., Volberg, R., Wynne, H. (1994) Leisure behavior on the edge: Differences between controlled and uncontrolled gambling practices. *Society & Leisure*, 17, 1, pp 233-248
- Specker, S., Carlson, G., Edmonson, K., Johnson, P., Marcotte, M. (1996) Psychopathology in pathological gamblers seeking treatment, *Journal of Gambling Studies*, 12, 1, pp 67-81
- Spellerberg, A. (2001) *Framework for the measurement of social capital in New Zealand*, Statistics New Zealand, Wellington. Statistics New Zealand, Wellington.
- Sproston, K., Erens, B., Orford, J. (2000) *Gambling Behaviour in Britain: Results from the British Gambling Prevalence Survey*. London: NatCen
- Stinchfield, R. & Winters, K. (1996) *Treatment effectiveness of six state-supported compulsive gambling treatment programs in Minnesota*, Minneapolis, MN: Minnesota Department of Human Services
- Stitt, B., Nichols, M., Giacomassi, D. (2003) Does the Presence of Casinos Increase Crime? An Examination of Casino and Control Communities, *Crime & Delinquency*, Vol. 49, No. 2, 253-284
- Strachan, M. & Custer, R. (1993) Female compulsive gamblers in Las Vegas, In *Gambling Behavior and Problem Gambling*, Eadington, W. & Cornelius, J. (eds), Reno, NV: Institute for the Study of Gambling and Commercial Gaming, pp 235-238
- Suissa, A. (2005) Gambling, Violence, and Family Dynamics: Some Intervention Markers, *International Journal of Mental Health & Addiction*, 2, 2, pp. 1-5
- Surgeon General (2006) *The Health Consequences of Involuntary Exposure to Tobacco Smoke, A Report of the Surgeon General*, U.S. Dept. of Health and Human Services, Centers for Disease Control and Prevention, Atlanta, GA.
- Swiss Institute of Comparative Law (2006) *Study of Gambling Services in the Internal Market of the European Union*. European Commission
http://ec.europa.eu/internal_market/services/gambling_en.htm
- Thalheimer, R. and Ali, M. (2007) The demand for casino gaming with special reference to a smoking ban, *Economic Inquiry* (in press- published on-line as a forthcoming article, May, 2007)
- Thomas, S., Jackson, A., Blaszczynski, A. (2003) *Measuring problem gambling: Evaluation of the Victorian Gambling Screen*, Report to the Gambling Research Panel by Melbourne Enterprise International.
- Thompson, W., Gazel, R., Rickman, D. (1996) The social costs of gambling in Wisconsin, *Wisconsin Policy Research Institute Report*, 9, 6, pp 1-44
- Tran, D. (1999) *Asian Gambling ... Family Losses: A Study of Gambling Related Violence in the Vietnamese Community*. Melbourne: Jesuit Social Services
- Trochim, W. (2000) *The Research Methods Knowledge Base, 2nd Edition*, Cincinnati, OH: Atomic Dog Publishing
- Tubery, A. (1987) Usages et symboliques de la machine a sous dans la Sierra Norte de Seville. *Ethnologie Francaise* 17 (2/3): 184-188.

Rachel Tuffin, R., Morris, J. & Poole, A. (2006) *An evaluation of the impact of the National Reassurance Policing Programme*. Home Office Research Study 296, Home Office Research, Development and Statistics Directorate.

United States General Accounting Office (2000) *Impact of gambling: Economic effects more measurable than social effects*, Report to the Honorable Frank R. Wolf (No. GGD-00-78). Washington, DC: General Accounting Office

Volberg, R.A. (2001a) *When the chips are down: Problem gambling in America*. New York, NY: The Century Foundation.

Volberg, R.A. (2001b) *Gambling and problem gambling in North Dakota: A replication study, 1992 to 2000*. Bismarck, ND: Office of the Governor.

Volberg, R.A. & Steadman, H.J. (1992) Accurately depicting pathological gamblers: Policy and treatment implications. *Journal of Gambling Studies* 8 (4): 401-412

Volberg, R.A. (2003) Has there been a "feminization" of gambling and problem gambling in the United States? *Electronic Journal of Gambling Issues* 8
<http://www.camh.net/egambling/issue8/feature/index.html>

Volberg, R.A. & Wray, M. (In press) Legal gambling and problem gambling as mechanisms of social domination? Some considerations for future research. *American Behavioral Scientist*.

Volberg, R.A., Toce, M.T. & Gerstein, D.R. (1999) From back room to living room: Changing attitudes toward gambling, *Public Perspective* 10 (5) pp 8-13

Walker, D. M., 'A Simple Model to Explain and Illustrate the Definition of 'Social Cost'', 1st International Symposium on the Economic and Social Impact of Gambling, Whistler, British Columbia, 2000.

Walker, D.M. and Barnett, A.H., (1999) The Social Cost of Gambling: An Economic Perspective, *Journal of Gambling Studies*, 15, 181-212.

Welte, J., Barnes, G., Wieczorek, W., Tidwell, M-C. & Parker, J. (2001) Alcohol and gambling among U.S. adults: Prevalence, demographic patterns and comorbidity. *Journal of Studies on Alcohol*, 62 (5) pp 706-712.

Wenz, M., (2007) The impact of Casino Gambling on Housing Markets: A Hedonic Approach, *Journal of Gambling, Business and Economics*, 1, 2, 100-120.

Williams, R. & Stevens, R. (2006) *The devil is in the details: Overview of the main methodological issues in cost/benefit analyses of gambling*. Paper presented at the Alberta Gaming Research Institute Conference on Social and Economic Costs and Benefits of Gambling. Banff, Alberta, April 20-22, 2006.

Williams, R., Hann, R., Schopflocher, D., Wood, R., Grinols, E. & McMillen, J. (2006) *Bellville Cohort Study: Project Summary*. Toronto: Ontario Problem Gambling Research Centre. Available at <http://www.gamblingresearch.org/>

Willig R., (1976) Consumer's Surplus Without Apology, *American Economic Review*, 66, 589-597

York Health Economics Consortium, 2006, *Cost Benefit Analysis of Health Impact Assessment*, Department of Health
<http://www.dh.gov.uk/assetRoot/04/14/08/39/04140839.pdf>

Zimmer, L.J. (1987) Gambling with cards in Melanesia and Australia: An introduction. *Oceania* 58 (1): 1-5.

Zola, I.K. (1964) Observations on gambling in a lower-class setting. In *The other side: Perspectives on deviance*, Becker, H.S. (ed.). New York, NY: Free Press. (Pp. 247-260).