The Coombe Women's Hospital Study of **Alcohol, Smoking, and Illicit Drug use, 1987 - 2005.**

Contents

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Introduction:

The publication of two Reports of the Strategic Task Force on Alcohol in 2002[1] and 2004[2] and a Report from the Joint Oireachtas Committee on Health & Children, Sub-Committee on Alcohol Misuse[3] has changed the way in which alcohol is viewed in Ireland. In spite of concerns of a link between maternal alcohol consumption and compromised foetal outcome, there has been a dearth of research quantifying alcohol and other substance use among pregnant women in Ireland, looking at trends of use, and ultimately foetal effect.

In 1992, a study of 100 women attending the Antenatal Clinic in the Rotunda Hospital[4] reported on the lack of awareness among pregnant women of the risks of prenatal alcohol exposure although their knowledge of the risks of smoking was considerable. Only 11% of those women could recall being told by their GP of the risks of drinking in pregnancy but 58% were aware of the perils of smoking. Since then there have been considerable changes in Irish drinking patterns with the College Lifestyle and Attitudinal National (CLAN) survey in 2005 showing that levels of binge drinking among young Irish women are increasing[5], and this has been directly linked to unplanned sexual activity and failure to use contraception.[6,7] Thus, it is timely to investigate the extent of alcohol and other substance consumption in pregnancy in Ireland.

Since the economic successes of the mid 1990s, Ireland has become a more multi-cultural society, with a growing number of young women of child-bearing years coming into the country as economic migrants or refugees. The upward trend in our previously reported declining birth rate may be due in part to this. This influx may also impact on the habits of pregnant women who present to maternity hospitals, and should be examined. We report on data recorded at the ante-natal clinic in the Coombe Women's Hospital since 1988.

Foetal Alcohol Spectrum Disorders:

The teratogenic effects of alcohol were first described in a provincial French medical journal by Lemoine *et al* in 1968[8], and subsequently in the international literature[9]. That description of *Foetal Alcohol Syndrome* refers to a clinically recognisable cluster of physical and central nervous system/neuro-developmental abnormalities present in the newborn infants of mothers who have been chronic consumers of large amounts of alcohol around the time of conception or during pregnancy. Signs include retarded growth both before and after birth, mental retardation and delayed mental development, characteristic structural abnormalities of the face and head (small head, small eye openings, eyelid droop, upturned nose, thin upper lip), and abnormalities of heart, joints, and limbs.

Today, the umbrella term, *Foetal Alcohol Spectrum Disorder* (FASD) is used to describe a spectrum of disorders that includes the complete Foetal Alcohol Syndrome, partial Foetal Alcohol Syndrome (without facial effects) and Alcohol Related Neuro-developmental Disorder (ARND). FASD has an estimated prevalence of between 4.0 and 9.9 per 1,000 live births in Western countries[10].

Recent research has begun to distinguish the specific neuro-behavioural effects of prenatal alcohol exposure on the infant and the latest evidence indicates that these effects are more widespread than previously considered and can result from lower levels of exposure to alcohol[11] than was previously thought. Binge drinking has been highlighted as particularly harmful to the foetus even when weekly average alcohol levels are relatively low. There has been considerable exploration of the specific nature of the executive functioning impairments and behavioural problems associated with the type of central nervous system damage produced by foetal alcohol exposure[12, 13]. These have highlighted the long-term difficulties and high rates of secondary problems faced by these children, leading to delinquency[14], substance misuse, suicide and psychiatric disorders[15, 16]. The kind of problems seen in these children often masquerade as Attention Deficit Hyperactivity Disorder (ADHD) or Oppositional Defiant Disorder with similar problems of attention and

behavioural control. FASD as well as overlapping with ADHD also include features of autism and personality disorder, and skilled differentiation and intervention is required. It is estimated that large numbers of those with ARND are unidentified and misdiagnosed, and early intervention programmes that might remedy these handicaps are consequently being overlooked.

The recent publication of a US-conducted 21-year longitudinal analysis of the significant effects of prenatal alcohol exposure on young adult drinking related problems, independent of the effects of family history of alcohol problems, nicotine exposure and other drugs, has further emphasised the need for an Irish-based study[17]. Quantifying this could serve as a useful stimulant to addressing FASD and formulating a Health Education Programme for Irish women planning a pregnancy or those of child bearing age.

Objectives:

1. To describe the reported prevalence and patterns of alcohol use in women attending the Coombe Women's Hospital between 1987 and 2005.
2. To describe the reported prevalence and patterns of nicotine use in the same cohort.
3. To describe the reported prevalence and patterns of illicit drug use and polysubstance use in the Coombe Women's Hospital since 1999
4. To examine the relationship between a set of pregnancy outcome indicators (birth weight, APGAR score*) and the consumption patterns determined in objectives 1 - 3.
5. To examine the extent to which pregnancy influences substance (alcohol, nicotine, illicit drug) consumption.

***APGAR score**

The Apgar score was developed in 1952 by an American anaesthetist, Virginia Apgar. It is also referred to as an acronym for: Activity, Pulse, Grimace, Appearance, and Respiration and is the test used to quickly evaluate a newborn's physical condition after delivery and to determine any immediate need for extra medical or emergency care. A score of 10/10 is usual in a healthy baby with 2 points allocated for each of the 5 areas examined.

Methodology:

The Coombe Women's Hospital computerised database was set up in the late 1980s. Since that time, clinical data has been routinely collected by nursing staff at the antenatal booking clinic and in the labour ward and subsequently entered on the hospital's main frame computer by clerical staff.

This study entails an examination of relevant aspects of this anonymised data, carried out with the approval of The Coombe Women's Hospital Ethics Committee. The hospital computer system was modernised in 1999 and more fields were added. The format of some of the questions asked was also modified at this time. Data relevant to this study that was collected post-1999 were exported to the Statistical Package for the Social Sciences (SPSS) and analysed. It was not possible to perform the same degree of analysis on the pre-1999 data.

Results:

The entire database examined comprised data from 125,945 women: 82,627 women had presented to the hospital from 1 January 1987 until the 30 June 1999 at which point the computer system was upgraded; 43,318 mothers presented from the 1 July 1999 until the 30 March 2005 when the present analysis commenced.

SECTION A ALCOHOL

Reported alcohol use in child bearing women before they became pregnant is broken down into those who presented to the hospital pre- and post-1999.

Table 1: Reported alcohol use *before* pregnancy
(1 January 1987 – 30 June 1999)

Never	**12,205**	*(14.8%)*
Occasional	**25,368**	*(30.7%)*
Several days per week	**38,952**	*(47.1%)*
Missing data	**6,102**	*(7.4%)*
Total	**82,627**	*(100%)*

The pre-1999 database recorded the *frequency* of alcohol consumption rather than the *quantity* consumed. Expectant mothers were asked about any changes in their alcohol intake as a consequence of becoming pregnant and of those who were alcohol users, 81% reported that they stopped or decreased their alcohol use and 19% did not change their alcohol use. No information was sought on alcohol use during pregnancy on that database.

Table 2: Reported alcohol use *before* pregnancy
(1 July 1999 – 30 March 2005)

Never	**7,210**	*(16.6%)*
≤5units/week	**28,197**	*(65.1%)*
≥6 units/week	**3,947**	*(9.2%)*
Missing data	**3,964**	*(9.1%)*
Total	**43,318**	*(100%)*

Of the 3,947 women who reported drinking 6 or more units per week before pregnancy 83 drank more than 20 units.

Table 3: Annual trends in reported maternal alcohol use (percentages) *before* pregnancy (*1988 - 1998*)

	Never drank	Occasional alcohol use	Several days/ week
1988	19.5	38.7	41.8
1989	16.3	36.7	47.0
1990	17.1	32.8	50.1
1991	16.3	32.4	51.3
1992	16.4	31.3	52.3
1993	15.8	32.3	51.9
1994	15.1	37.3	47.6
1995	15.0	33.4	51.6
1996	13.8	31.8	54.4
1997	14.1	30.5	55.4
1998	15.2	29.3	55.5

Table 4: Annual trends in reported maternal alcohol use (percentages) *before* pregnancy *(2000 - 2004)*

Year	No alcohol before pregnancy	≤5 units/ week	≥6 units/ week
2000	17.3	71.5	11.2
2001	17.4	71.2	11.4
2002	18.0	72.8	9.2
2003	19.7	70.0	10.3
2004	19.1	71.9	9.0

In **tables 3** and **4** data are presented where it is available for full years. The percentages that reported that they did not drink before pregnancy dropped from 1988 until the turn of the millennium and have risen since then. Data for the earlier time periods suggest an increase in those who reported drinking several times a week up to the turn of the millennium.

Table 5: Reported alcohol use by pregnant women *(1999 - 2005)*

No alcohol	**11,962**	*(27.6%)*
≤5units/week	**24,300**	*(56.1%)*
≥6-9 units/week	**2,362**	*(5.5%)*
≥10 units/week	**709**	*(1.6%)*
Missing data	**3,985**	*(9.2%)*
Total	**43,318**	*(100%)*

Overall, 61 pregnant women (0.14%) reported that they drank more than 20 units per week.

Table 6: Maternal nationality (*1999 - 2005*).

Nationality of Mothers	**Total number**	
Republic of Ireland	**31,307**	*(72.3%)*
United Kingdom	**2,067**	*(4.8%)*
Other European Union	**576**	*(1.3%)*
Non-European Union	**4,882**	*(11.3%)*
Missing data on nationality	**4,486**	*(10.3%)*
Totals	**43,318**	*(100%)*

Information on maternal nationality became available from 1999 onwards reflecting the considerable influx of economic migrants and asylum seekers of child bearing years to Ireland from the mid 1990s onwards. The nationality of pregnant women seeking antenatal care at the hospital is set out in **Table 6**.

Table 7: Nationality and reported alcohol use (percentages) in pregnant mothers *1999 - 2005*.

	No alcohol	≤5units/ week	≥6-9units/ week	≥10 units/ week	N=35,38
Republic of Ireland	21.0	69.3	7.5	2.2	28,484
United Kingdom	23.9	66.5	6.9	2.7	1,868
Other European Union	31.6	64.7	2.9	0.8	525
Non-European Union	74.1	24.8	0.9	0.3	4,505

Table 7 shows that Irish and UK-born mothers had a lower likelihood of reporting themselves to be non-drinkers in pregnancy and highlights a marked difference between Irish & UK born mothers, and the rest of EU & the non EU mothers when it comes to reported alcohol consumption of more than 6 units/week.

Table 8: Reported maternal alcohol use (percentage) by age, in pregnancy for Irish mothers (*1999-2005*)

Age bands	No Alcohol	≤ ≤5 units /week	≥6-9 units /week	≥10 units /week	N=25,312
14-17	34.6	59.2	4.4	1.8	451
18-24	23.7	66.4	6.5	3.4	5,178
25-29	23.2	68.2	6.6	2.0	6,034
30-34	19.6	70.6	8.0	1.8	8,277
35-39	20.4	69.7	8.4	1.5	4,565
40+	22.4	67.8	8.4	1.4	807

Table 8 shows that two-thirds of all pregnant under-18 year olds reported drinking alcohol during pregnancy. The 18-24 age category reported the highest percentage drinking over 10 units per week. Overall, in most age categories about 1 in 10 women report drinking more than 6 units of alcohol per week in pregnancy.

SECTION B SMOKING

Table 9: Reported maternal smoking (percentages) in pregnancy *(1988 - 1998)*

CIGARETTES / DAY	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
<10/day	84.2	85.1	85.2	85.9	87.5	87.0	87.9	88.6	88.4	88.8	89.4
10-19/day	13.0	12.9	12.6	11.7	10.4	10.8	10.2	10.3	9.9	9.4	8.8
20+/day	1.7	1.7	1.8	1.9	1.8	1.7	1.6	1.8	1.4	1.3	1.1
No data	1.1	0.3	0.4	0.5	0.3	0.5	0.4	0.3	0.3	0.5	0.7
Total	100	100	100	100	100	100	100	100	100	100	100

Table 9 shows an increase in lower levels of smoking or non smoking over a decade or more, and a reduction in those smoking higher numbers of cigarettes.

Table 10: Reported maternal smoking (percentages) by age, in pregnancy (*1999-2005*)

Age Bands	% have ever smoked	% stopped in pregnancy
14-17	66.6	27.8
18-24	61.0	28.2
25-29	46.2	41.3
30-34	43.3	58.8
35-39	41.9	61.8
40+	42.9	58.9

Table 10 shows that a higher percentage of the very young expectant mothers report themselves as smokers than older mothers; and that less of these younger mothers are likely to stop smoking in pregnancy.

Table 11: Annual trends (percentages) of pregnant smokers reporting that they stopped in pregnancy *2000 -2005*

Year	Stopped smoking	≤ 5 cigarettes/day	≥6-10 cigarettes/day	11-20 cigarettes/day	>20 cigarettes/day
2000	41.8	16.9	23.0	16.6	1.7
2001	43.0	15.7	23.5	16.1	1.7
2002	44.5	15.9	21.9	15.8	1.9
2003	50.8	12.6	20.6	14.4	1.6
2004	52.4	13.3	18.5	13.7	2.1
2005	53.5	13.9	17.3	13.7	1.6

Table 11 shows an increasing number of women who reported stopping smoking during their pregnancy.

Table 12: Influence of age (percentages) on reported smoking cessation in expectant mothers *(1999-2005)*

Age Bands	Stopped smoking	≤ 5 cigarettes/day	≥6-10 cigarettes/day	11-20 cigarettes/day	>20 cigarettes/day
14-17	27.8	22.1	37.7	11.6	0.8
18-24	28.2	19.2	32.2	18.5	1.9
25-29	41.3	15.6	22.8	18.2	2.1
30-34	58.8	12.2	14.8	12.7	1.5
35-39	61.8	11.1	13.3	11.7	2.1
40+	58.9	10.9	15.3	13.6	1.3

Table 12 shows that younger smokers are less likely to give up smoking during pregnancy.

SECTION C ILLICIT DRUGS

Only 447 (4.57%) of all pregnant women who registered at the Coombe Women's Hospital from 1999-2005 reported having used illicit drugs in pregnancy.

Table 13 refers to women with a history of illicit drug use who reported using drugs in pregnancy. The most common drug use in pregnancy was methadone which would be prescribed rather than illicit. Similarly diazepam numbers refer to a combination of prescribed and illicit and the other drugs are illicitly used. The total is more than 447 because there would be polysubstance use amongst these women.

Table 13: Frequency of consumption of drugs in 447 women who reported illicit drug use in pregnancy

Methadone	323
Cannabis	87
Heroin	64
Diazepam	51
Ecstasy	14
Cocaine	13

The reported drinking and smoking habits of these 447 women are presented in **tables 14** and **15**. Whereas the majority of women reported themselves to be light drinkers or abstainers nearly half of all of them report themselves to be heavy smokers.

Table 14: Reported drinking habits of 447 drug using mothers (*1999 – 2005*)

No alcohol	**130**	*(29.1%)*
Occasional 1- 5 units / week	**253**	*(56.6%)*
6-9 units / week	**20**	*(4.5%)*
≥ 10 units / week	**4**	*(0.9%)*
Missing data	**40**	*(8.9%)*
Total	**447**	*(100%)*

Table 15: Reported smoking habits of 447 drug using mothers (*1999 – 2005*)

Never smoked	**30**	*(6.7%)*
Stopped in pregnancy	**12**	*(2.7%)*
Occasional	**5**	*(1.1%)*
1 – 5 / day	**41**	*(9.2%)*
6 – 9 / day	**132**	*(29.5%)*
11 – 20 / day	**163**	*(36.5%)*
20+ / day	**37**	*(8.3%)*
Missing data	**27**	*(6.0%)*
Total	**447**	*(100%)*

SECTION D BIRTH OUTCOMES

The relationship between low birth weight and alcohol use, smoking and illicit drug use in pregnancy is given in **tables 16 to 18**. The highest rates of low birth weight were in heavy smokers and users of illicit drugs. There were many missing data for smoking and birth weight.

Table 16: Birth weight of infants of reported drug using mothers (*1999 – 2005*)

	Less than 2500g	2500g and over	Total
Illicit drug use in pregnancy	**74** *(16.6%)*	**372** *(83.4%)*	**446** *(100%)*
No illicit drug use in pregnancy	**2,190** *(5.1%)*	**40,568** *(94.9%)*	**42,758** *(100%)*
Total	**2,264**	**40,940**	**43,204**

Table 17: Reported maternal alcohol consumption and infant birth weight (*1999-2005)*.

	Less than 2500g	2500g and over	Total
None	**640** *(5.4%)*	**11,797** *(94.6%)*	**12,437** *(100%)*
≤5 units / week	**1,261** *(5.5%)*	**22,970** *(94.5%)*	**24,231** *(100%)*
≥6 units / week	**141** *(4.6%)*	**2,920** *(95.4%)*	**3,061** *(100%)*
Total	**2,042**	**37,687**	**39,729**

Table 18: Reported maternal smoking and infant birth weight (*1999 - 2005)*

	Less than 2500g	2500g and over	Total
Stopped	**298** *(3.4%)*	**8,654** *(96.6%)*	**8,952** *(100%)*
≤5 cigarettes day	**162** *(6.0%)*	**2,558** *(94.0%)*	**2,720** *(100%)*
6-10 cigarettes / day	**327** *(8.5%)*	**3,530** *(91.5%)*	**3,857** *(100%)*
≥11 cigarettes / day	**318** *(10.0%)*	**2,862** *(90.0%)*	**3,180** *(100%)*
Total	**1,105**	**17,604**	**18,709**

The relationship between a 10 minute APGAR score and alcohol use, smoking and illicit drug use in pregnancy are given in **tables 19** to **21**. The highest APGAR scores were in those women who had stopped smoking although there were many missing data in this analysis.

Table 19: APGAR score at 10 minutes post delivery in reported drug using mothers (*1999 – 2005*)

	8 or less	9 – 10	Total
Any illicit drug use	**13** *(3.0%)*	**421** *(97.0%)*	**434** *(100%)*
No illicit drug use	**1,247** *(2.9%)*	**41,612** *(97.1%)*	**42,859** *(100%)*
Total	**1,260**	**42,033**	**43,293**

Table 20: APGAR score at 10 minutes post delivery in reported alcohol consuming mothers (*1999 – 2005*)

	8 or less	9 – 10	Total
No alcohol	**352** *(3.0%)*	**11,477** *(97.0%)*	**11,829** *(100%)*
≤5 units/week	**674** *(2.8%)*	**23,350** *(97.2%)*	**24,024** *(100%)*
≥6 units/ week	**85** *(2.8%)*	**2,961** *(97.2%)*	**3,046** *(100%)*
Total	**1,111**	**37,788**	**38,899**

Table 21: APGAR score at 10 minutes post delivery in mothers who reported themselves as smokers (*1999 – 2005)*

	8 or less	9 – 10	Total
Stopped	**224** *(2.5%)*	**8,684** *(97.5%)*	**8,908** *(100%)*
≤5 cigarettes/day	**92** *(3.4%)*	**2,608** *(96.6%)*	**2,700** *(100%)*
6-10 cigarettes/day	**126** *(3.3%)*	**3,695** *(96.7%)*	**3,821** *(100%)*
≥11 cigarettes/day	**89** *(3.4%)*	**2,495** *(96.6%)*	**2,584** *(100%)*
Total	**531**	**17,482**	**18,013**

DISCUSSION:

Data

The Coombe Women's Hospital is to be commended for systematically enquiring about and electronically recording a wide range of habits and behaviours, including substance use that impact on pregnancy and its outcome over the past 20 years. While the data systems changed and were expanded in 1999, much of the data in the pre-1999 and post-1999 time periods are comparable. In the intervening years different instruments have been developed that should enable data to be collected prospectively in relation to alcohol use, illicit drug use and smoking in pregnancy.

There are limitations to the data analysed in this study. Data were self reported and collected over 20 years by hundreds, if not thousands, of staff whose main priority was clinical care of pregnant women rather than the gathering of epidemiological data. Thus, standardisation of data collection methods and validation of data was not possible. The collection of data in relation to opiate use in particular requires a more focussed approach not easily achievable in a busy maternity outpatient setting. Similarly, collection of alcohol consumption levels and patterns requires a more detailed approach than was possible here. For these reasons we do not wish to over interpret our findings and are not presenting a set of statistical results on the data. Nevertheless, we believe that some of the results are striking and cannot be ignored.

Substances Used

The data in this study corroborate other research that has been carried out in Ireland, over the past decade in particular, which shows high levels of alcohol use amongst women of childbearing age. It is not surprising that the rates of alcohol use in pregnancy are high and rising as there has been little concerted policy effort in this regard. A possible reason for the reported reduction in the rate of alcohol use in pregnancy since 2000 has been the increased proportion of women born outside Ireland who have given birth in Ireland since 2000. Our study has found that rates of alcohol use in pregnant women born outside of Ireland or the United Kingdom are much lower than those of pregnant women from these islands.

The data in relation to heavy alcohol use in younger expectant women are worrying. Over the period of this study more international information has become available on FASD and the risks to infants born to women who drink in pregnancy. Our data trends would suggest that the risks of alcohol related foetal harm in Ireland are high. Unfortunately the risks in Ireland are unquantified and this is a public health matter that needs urgent attention.

The Strategic Task Force on Alcohol addressed the issue of alcohol and pregnancy. It recommended that pregnant women and women who were planning to become pregnant be discouraged from alcohol consumption. The Strategic Task Force further recommended a health warning label to be placed on all alcohol products and greater awareness of the different contexts and situations where alcohol use should be avoided to reduce the risk of harm, including pregnancy.

If an attempt is to be made in Ireland to limit the harm done by pre-natal alcohol consumption a concentrated effort is going to be required. The evidence from our report suggests that action should be taken now to make the reduction in alcohol consumption in pregnancy a priority, as is already the case in relation to smoking and illicit substances.

Messages relating to smoking in pregnancy are having some effect as demonstrated by the increase in the number of people stopping smoking over the last 6 years. This message appears to have been taken on board by older women and efforts need to be targeted more particularly at women under the age of 24 who are pregnant and smoking.

Initiatives organised through the National Drugs Strategy or by the National Advisory Committee on Drugs need to address illicit drug use in pregnancy where appropriate as our study has demonstrated an increase in low birth weight infants of women who use illicit drugs in pregnancy.

The way forward

Research should be a catalyst for action. Notwithstanding the caveats in relation to the data expressed earlier and the circumscribed nature of this report *prima facie* evidence has been found to suggest that we need to take the issue of alcohol in pregnancy in Ireland much more seriously. Efforts to reduce alcohol consumption in pregnancy are haphazard and not systematic. This matter has been raised by the Strategic Task Force on Alcohol but concerted action is imperative.

There is scope for more comprehensive and systematic data collection in the pregnancy setting in Ireland. This can be accomplished in hospital based ante-natal services and through primary care. This may require feasibility studies before it becomes mainstream practice. As well as improving the quality of data collection in pregnancy it will be necessary to put in place systems for better diagnosis of the range of FASD in Ireland. This will require the collaboration of paediatricians, child psychiatrists and other health professionals. The work should begin now as it will take some time to get systems in place to raise awareness of the issue.

Conclusions:

There has been a change in smoking and drinking behaviour in women presenting for antenatal care over the past two decades. In the main, smoking in pregnancy has diminished whereas alcohol consumption has increased. Over the almost 2 decade time span of this study international evidence of the potential hazards of alcohol consumption in pregnancy has become apparent. The alcohol consumption patterns in pregnancy which this study has uncovered point to the need for a much more proactive policy and a set of actions to reduce alcohol intake in pregnancy, thus reducing harm to future cohorts of Irish born children.

Recommendations:

1. Implement recommendations 6.11 and 6.12 of the Second Report of the Strategic Task Force on Alcohol*.

2. Determine the feasibility of routine collection of ante-natal alcohol, tobacco and illicit drug use in all hospital and primary care settings.

3. Based on the feasibility study (recommendation 2) establish routine ante-natal monitoring of substance use.

4. Put in place a system for the post natal detection of FASD in Ireland.

5. Continue efforts to minimise foetal exposure to tobacco, alcohol and illicit drugs.

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*Strategic Task Force on Alcohol, Second Report, September 2004, page 39

R.6.11. *Encourage pregnant women and women who are planning to become pregnant to avoid alcohol consumption, especially during the critical first trimester of pregnancy.*

R 6.12. R*equire a health-warning label on all alcohol products and alcohol promotional materials.*

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