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# A Decade of DOVE: Multidisciplinary Experience from an Obstetric Addiction Clinic

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**Abstract**

***Aim***

To review a decade of attendances at an obstetric addiction clinic and compare with the general hospital population.

***Methods***

Retrospective study of activity between 2009 and 2018. Metrics were reviewed and compared with outcomes for the entire Rotunda Hospital population. Linear regression analyses and Chi square analyses were used as appropriate.

***Results***

The rate of attendance has remained stable over the decade studied, 12/1000births. Opioid addiction has significantly ($p=0.04$) declined and other addictions have increased ($p<0.001$). Comparing the addiction and non-addiction populations, caesarean section rates are equivalent while unassisted birth is higher (62.2% vs 49.9%, $p<0.0001$) and instrumental birth is lower (7.4% vs 17.4%, $p<0.0001$). Prematurity & Fetal growth restriction are more common in the population with addiction. Neonatal abstinence syndrome (NAS) and positive maternal virology have fallen over the decade.

***Discussion***

This limited retrospective review of women with addiction in pregnancy identifies a changing profile of attendances. It acknowledges the important role of the drug liaison midwife. It highlights increased risks for this population regarding prematurity and growth restriction, and it is important that these are reflected in care pathways and patient education. Further prospective multivariate analysis is advised to drive responsive service planning to optimise care of pregnant women with addiction.

## Introduction

Drug[1] and alcohol use in pregnancy is a worldwide issue, with Ireland being ranked as one of the top five countries for prevalence of both alcohol use during pregnancy and fetal alcohol syndrome (the most severe form of Fetal Alcohol Spectrum Disorder (FASD) [2]. The consequences of continued alcohol and drug misuse can be significant. As well as the potential risk of neonatal abstinence syndrome (NAS), infants born to mothers who misuse substances during pregnancy face a greater risk of prematurity, low birth weight, behavioural issues and learning difficulties[3].

Pregnancy may provide opportunities to engage vulnerable women into essential health care. However, women with addiction may have poor adherence with antenatal appointments, presenting late in pregnancy or not until they are in labour [4,5] which may reflect a service which fails to recognise their lifestyle and needs[6].

Specialist care for pregnant women with a history of opioid addiction is underpinned by evidence highlighting that compared to ongoing heroin use, Opioid Substitution Treatment (OST, - primarily methadone), along with optimal multi-disciplinary care, has been associated with improved perinatal outcomes[7] although adverse perinatal outcomes remain common in methadone exposed pregnancies[8].

Drug Liaison Midwives (DLM) were appointed to the three Dublin maternity hospitals in 1999. Women can self-refer to the service, or can be referred by primary care, an antenatal first visit (following routine enquiry) or directly from the community addiction services. Coordination by the DLM enables fast access to obstetric and drug treatment services (if not already in treatment) to stabilise maternal drug use and can significantly reduce stigma and harm [9,10]. The National Maternity Strategy[11] and the National Drugs Strategy[12] have emphasised that involvement with the maternity services provides opportunities to reduce drug dependence and have endorsed the role of the DLM and the associated multidisciplinary team approach, with a plan to roll out similar services to other maternity units.

At the Rotunda Hospital, this care is provided by the DOVE Clinic. The name DOVE began as an acronym for 'Danger Of Viral Exposure', but now we generally use 'DOVE' for its representation of hope and peace which resonates well across specialties and cultures. Although the hospital publishes an annual clinical report of key service activity each year, there has been limited focused research to date on ongoing provision of care for pregnant women with addiction[13,14]. This paper provides a detailed 10 year review of women with addiction in pregnancy, patterns of drug use, obstetric and neonatal outcomes including comparative metrics with the general hospital population.

## Methods

Annual reports of key service activity for the decade between 2009 and 2018 were collated and reviewed. Metrics were reviewed and compared with outcomes for the entire obstetric population from published Annual Clinical Reports of the Rotunda Hospital and presented per 1000 births >500g.

Rates of referral to DLM services, commencement of OST, misuse of other substances, positive virology and NAS were calculated per 1000 births. Linear regression analyses were used to examine the association between outcomes of interest and year of birth. The Chi square statistic was used to compare delivery categories between women care for in the DOVE clinic and the entire obstetric population. Stata SE 16 (College Station, TX: StataCorp LLC) was used for all analyses.

**Results**

Figure 1 demonstrates that attendances at the DOVE clinic have been stable over the past 10 years. With an average of 8793 births over 500g annually over the same decade, this represents a rate of attendance of approximately 12/1000 births. The number of women presenting with opioid addiction has significantly (p=0.04) declined and less women commenced OST for the first time in pregnancy in more recent years (p=0.002).

***Figure 1: Rates of contact with Drug Liaison Midwife (DLM), opioid addiction, commencement of opioid substitution treatment (OST) and non-opioid addiction over the decade studied per 1000 births.***

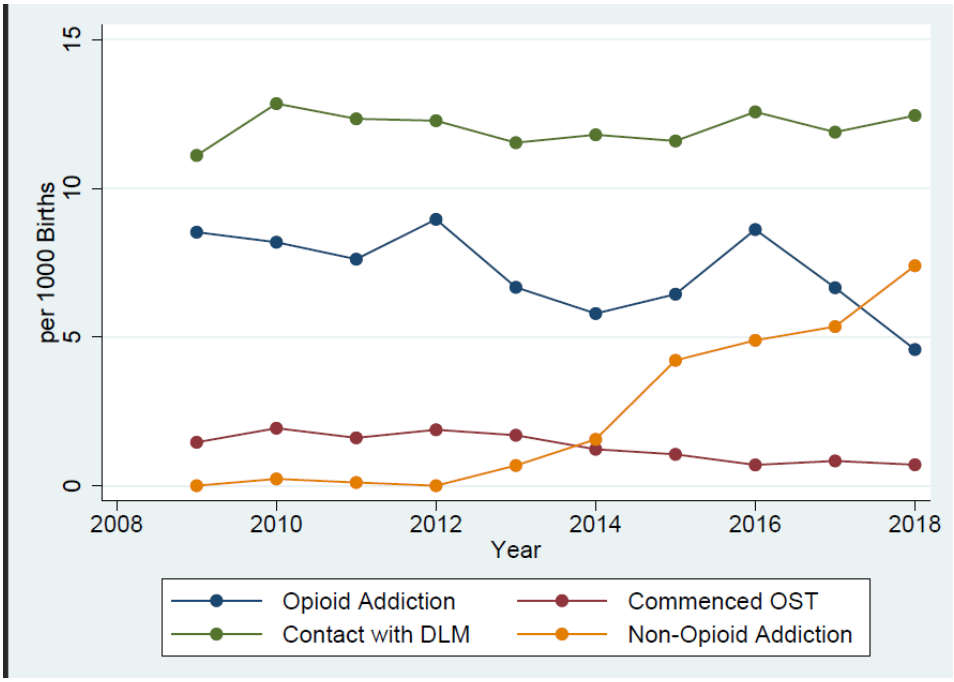
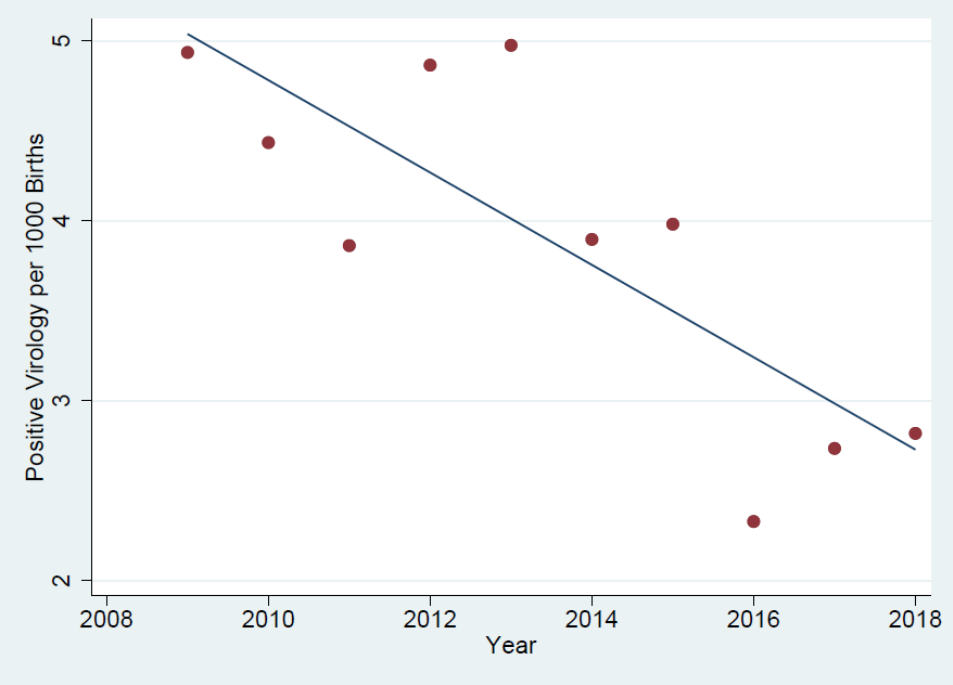



Figure 1 also demonstrates the changing patterns of addictions over the past decade, particularly in recent years. The graph demonstrates that disclosed addictions during pregnancy have changed, specifically the number presenting with non-opioid addiction has significantly (p<0.001) increased. To respond to this, *t*he DOVE clinic has evolved from providing care solely for women with opioid addiction, to providing support for those who disclose addiction to other substances (most frequently alcohol, benzodiazepines, cannabis, cocaine and over the counter analgesics).

Figure 2 demonstrates that the number of women attending the DOVE clinic with addiction who also have positive virology (HIV, Hepatitis B & C) has significantly (p=0.005) reduced.

***Figure 2: Ten-year prevalence of positive virology (HIV, Hepatitis B and Hepatitis C) per 1000 births.***




This review also compared labour outcomes and events of women attending the addiction service to the general hospital population recorded in annual clinical reports. When compared with figures for the general hospital population where a mean of 49.9% had unassisted vaginal births, women attending the addiction service were significantly ($p<0.0001$) more likely (62.2%) to have unassisted vaginal births. Instrumental delivery rates were significantly lower in the population with addiction (7.4% compared with 17.4%, $p<0.0001$). Caesarean section rates are similar in the two groups (30.4% in the population with addiction, compared with 30.07% in the general hospital population, $p=0.85$).

This review also identified that both prematurity and birthweight less than 2.5kg are overrepresented in women with addiction. In the general obstetric population 6.9% of women deliver less than 37 weeks' gestation, compared with 17.4% of the population with addiction ($p<0.0001$). Furthermore, infants born to women with addiction were significantly more likely to weigh less than 2.5kg than infants in the general hospital population (26.1% compared with 6.5%, $p<0.0001$).

Figure 3 demonstrates figures for NICU admission for infants born to women with addiction. While infants may be admitted due to neonatal abstinence syndrome (NAS), they may also require admission for other reasons e.g. low birth weight, prematurity and its associated complications. Newborns of mothers attending the DOVE clinic with addiction are more likely to require admission to NICU than infants of mothers in the general hospital population, and regression analysis does not identify a significant change in the proportion of infants of mothers with addiction requiring NICU admission ($p=0.43$) over the past decade. However, admissions for NAS per 1000 births have reduced over the period studied ($p=0.045$) (figure 4).

***Figure 3: Neonatal Intensive Care Unit (NICU) admission and Neonatal Abstinence Syndrome (NAS) rates compared with number of births in the clinic population.***

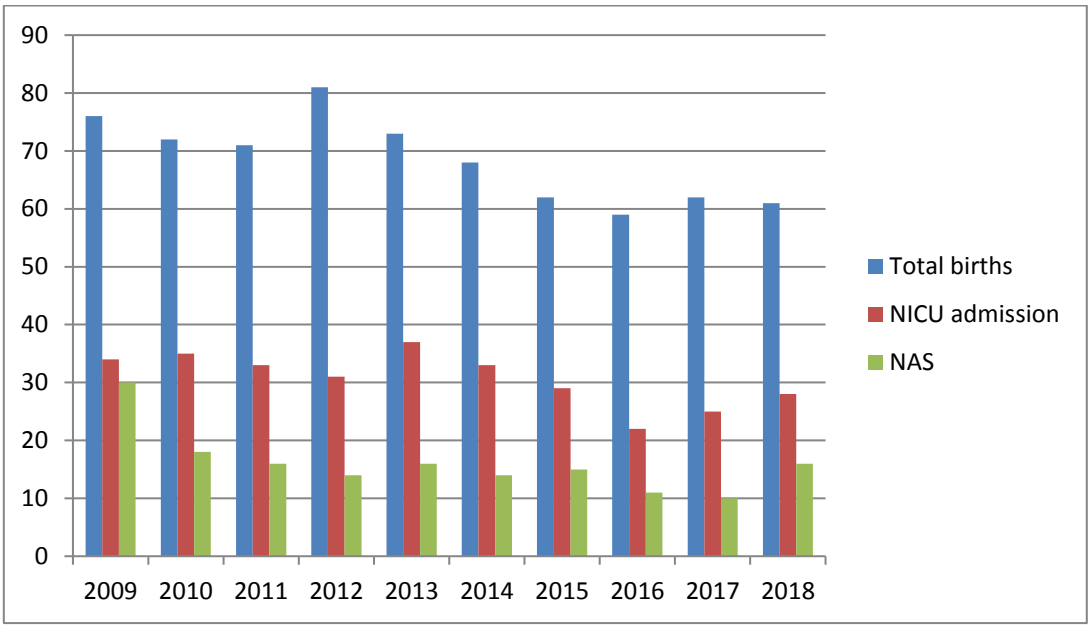
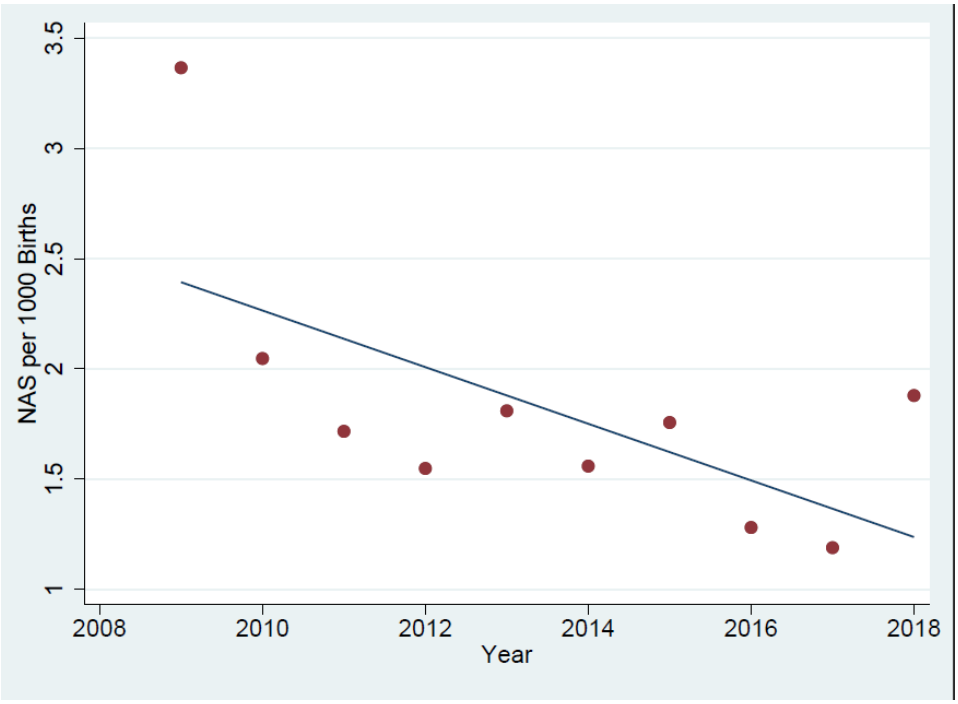



***Figure 4: 10 year prevalence of Neonatal Abstinence Syndrome per 1,000 births.***




Similarly, while only limited specific data on perinatal mortality and SIDS (sudden infant death syndrome) are available, both of these outcomes appear to be over represented in the population with addiction, with a mean of just less than one stillbirth (approx. PNMR 11.8 per 1000 births) and one SIDS (approx. rate 11.8 per 1000 births) annually, compared with an overall PNMR of 5.4/1000 birth in 2018 [15] and a SIDS rate of 0.58/1000 [16].

**Discussion**

This limited retrospective review of women attending the DOVE clinic with addiction in pregnancy identifies a number of trends and areas for comparison with the general obstetric population. While acknowledging the important role of the DLM it highlights areas for improvement in data collection and interventions to limit the additional maternal and neonatal health risks posed by addiction in pregnancy. This also provides worthwhile data for parent education as women plan pregnancies and navigate antenatal care.

The review highlights a relatively stable number of clinic attendances over the past decade. This represents the number of women who attend for antenatal review by the DLM, not the number of clinic visits or indeed those who miscarry, relocate geographically or terminate a pregnancy. Some women have a single review by the DLM, for example to address resolved addiction, and complete the remainder of their antenatal care in another antenatal clinic. The study demonstrates that the pattern of addiction has evolved since 2009, with less women presenting with opioid addiction and commencing OST for the first time in pregnancy in more recent years. These findings are consistent with other studies, which have highlighted a decrease in opioid misuse but an ageing opioid dependant population [17]. Fertility rates in this population may also be influenced by expanded availability and awareness of contraceptive options including provision of injectable contraceptives and referral for long acting reversible contraception (LARC) by the addiction services.

However, while opioid addiction has fallen, women are more likely to attend with other addictions. The service, and its allied agencies, need to ensure access to responsive care for these addictions to support affected women and to limit potential adverse effects.

In more recent years, the number of women with addictions with HIV and hepatitis has decreased. This is a positive development and may reflect changing addiction patterns and a reduction in the prevalence of intravenous drug misuse. Additionally, enhanced public health policy regarding broad, accelerated access to OST, expansion of needle exchange[18] and condom distribution services may have contributed.

The comparative data on mode of delivery between those with addictions and the general obstetric population are interesting and worthy of further prospective multivariate review incorporating other factors which influence intervention (age, parity and BMI). However, it is notable that while instrumental delivery rates are consistently lower in the population with addiction, caesarean section rates are not similarly low, perhaps due to the potential impact of positive serology on obstetric care (e.g. limitations on fetal blood sampling). The lower rates of instrumental birth in the population with addiction are particularly interesting, given that these neonates are more likely to be growth restricted and born prematurely, factors which might be expected to increase instrumental delivery rates for suspected fetal distress.

This review has also highlighted that infants of mothers with addiction have a relatively high likelihood of NICU admission, not simply for NAS. It is reassuring to note that the proportion of infants requiring admission for NAS has reduced over the decade. These metrics are important in terms of antenatal education of women with addiction, in order to prepare them for potential interventions that may be required and to optimise factors which may mitigate risk.

The perinatal mortality and SIDS data, although based on small numbers and extrapolated, are also notable. These rates may be influenced by prematurity and low birth weight, but they are worthy of ongoing prospective review to identify modifiable risks (e.g. social and lifestyle factors).

The strengths of this paper include that it represents a decade of care provision in a single clinical site with an established service caring for pregnant women with addiction. Undoubtedly it is limited by its retrospective nature and some of the metrics collated in this paper are based on small numbers (e.g. PNMR and SIDS rate). Nevertheless, the information is important to drive further analysis and subsequent improvement of these important outcomes in this vulnerable population. We look forward to embracing the opportunities of an electronic health care record (Maternal & Newborn Clinical Management System, MN-CMS) and enhanced data analytic capacity to produce insights that help improve outcomes for women and babies.

This paper highlights the work of a multidisciplinary antenatal service for changing patterns of addiction over the past decade. There are increased risks for this population in terms of prematurity and growth restriction, and it is important that these are reflected in care pathways and patient education.

Other development opportunities in the service include introduction of onsite vaccination for patients who find it challenging to access primary care as well as enhancing pathways for postpartum contraception. Developing Transitional Care facilities for families affected by NAS would also be a positive development to reduce separation of the mother from her infant.

It is also important that the data summarised in this paper is used for professional development of staff involved in the provision of care for this vulnerable group in order to enhance care and reduce stigma. We look forward to ongoing data analysis using MNCMS as well as implementation of the National Maternity Strategy and the National Drugs Strategy to enable other clinical sites nationally to offer a similar package of multidisciplinary care. National roll out of MNCMS in the remaining 15 maternity units will also enable review and analysis of national metrics on an ongoing basis.

**Declaration of Conflicts of Interest:**
Nothing to declare.

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**References:**


1. World Drug Report 2020 United Nations publication, Sales No. E.20.XI.6
2. Popova S, Lange S, Probst C, Gmel G, Rehm J. Estimation of national, regional, and global prevalence of alcohol use during pregnancy and fetal alcohol syndrome: a systematic review and meta-analysis. The Lancet Global Health 2017;5 (3): 290-299.
3. Covington, C. Y., Nordstrom-Klee, B., Ager, J., Sokol, R., & Delaney-Black, V. Birth to age 7 growth of children prenatally exposed to drugs: A prospective cohort study. Neurotoxicology & Teratology 2002; 24(4) 489–496.
4. Good, M.M., Solt, I., Acuna, J.G., Rotmensch, S., & Kim, M.J. (2010). Methamphetamine use during pregnancy: Maternal and neonatal implications. Obstetrics and Gynecology, 116(2), 330–334.
5. Smith L, Yonekura M.L., Wallace T., Berman, N., Kuo, J., & Berkowitz, C. (2003). Effects of prenatal methamphetamine exposure on fetal growth and drug withdrawal symptoms in infants born at term. Journal of Developmental and Behavioral Pediatrics 24(1):17-23. DOI: 10.1097/00004703-200302000-00006.
6. Hepburn, M. Substance abuse in pregnancy. Current Obstetrics & Gynaecology 2004; 14(6):419 425.
7. Finnegan L. P. Management of pregnant drug-dependent women. Ann NY Acad Sci 1978; 311: 135–46.
8. Cleary B. J., Donnelly J. M., Strawbridge J. D., Gallagher P. J., Fahey T., White M. J. et al. Methadone and perinatal outcomes: a retrospective cohort study. Am J Obstet Gynecol 2011; 204: 139.e1–9.
9. Scully M, Geoghegan N, Corcoran P, Tiernan M, Keenan E. Specialised drug liason midwife services for pregnant opioid dependant women in Dublin, Ireland. Journal of Substance AbuseTreatment 2004; 26(1):329-35
10. Miles, M., Chapman, Y., Francis, K. & Taylor, B. Midwives experiences of establishing partnerships: working with pregnant women who use illicit drugs. Midwifery 2014; 30(10) 1082-1087.
11. Creating a Better Future Together, National Maternity Strategy 2016-2026.
12. Reducing Harm, Supporting Recovery A health-led response to drug and alcohol use in Ireland 2017-2025
13. Cleary, B. J., Eogan, M., O'Connell, M. P., Fahey, T., Gallagher, P. J., Clarke, T., White, M. J., McDermott, C., O'Sullivan, A., Carmody, D., Gleeson, J. & Murphy, D. J. Methadone and perinatal outcomes: a prospective cohort study. Addiction 2012, 107, 1482-1492.
14. Cleary, B. J., Eogan, M., O'Connell, M. P., Fahey, T., Gallagher, P. J., Clarke, T., White, M. J., McDermott, C., O'Sullivan, A., Carmody, D., Gleeson, J. & Murphy, D. J. Methadone Dosing and Prescribed Medication Use in a Prospective Cohort of Opioid-Dependent Pregnant Women. Addiction 2013;108(4):762-70.
15. Rotunda Hospital Dublin, Annual Report 2019
16. http://www.sidsireland.ie/movies/sids_02/submenu_02/xml/statistics_p2.xml
17. Hay G, Jaddoa A, Oyston J, Webster J, Van Hout MC, Rael dos Santos A. Estimating the prevalence of problematic opiate use in Ireland using indirect statistical methods. Dublin 2017: National Advisory Committee on Drugs and Alcohol. http://www.drugsandalcohol.ie/27233/
18. Bingham,T., Harnedy,N., O'Driscoll,D., Keane,. R., Doyle,J. Review of Needle Exchange Provision in Ireland Health Service Executive Ireland 2015