



# Peri-conceptual Folic Acid Use in Ireland

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# Presentation Outline

- 1. Folic acid supplements – what are they and why are they important?**
- 2. Irish context – why is research on supplementation important for Ireland?**
- 3. Growing Up in Ireland**
- 4. Findings from the infant cohort of GUI regarding:**
  1. Prevalence of folic acid use in Ireland
  2. Predictors of folic acid use in Ireland
- 5. Limitations/further questions**
- 6. Conclusion**



# Folic Acid: What is it and why is it important?

- **Folic acid is a B vitamin – necessary for healthy foetal neural tube development during the first few weeks of pregnancy**
- **Folic acid use can prevent at least 50% of neural tube defects (NTDs) and may reduce the occurrence of other birth defects (Czeizel and Dudas, 1992)**
- **NTDs are among the most serious and common birth defects, and Ireland has one of the highest incidences of NTDs in Europe (1-1.5 per 1000 total births nationally, FSAI, 2006)**
- **Recommended that women planning pregnancy should use a folic acid supplement of 0.4mg/day (400 mcg) from at least 1month before until 3months after conception (i.e. in the peri-conceptual period) (Centres for Disease Control, 1992)**



# Folic Acid Supplementation: Irish Context

- **Two main strategies to increase folic acid intake among women of childbearing age:**
  1. **Supplementation policy (policy in Ireland and Europe)**
  2. **Mandatory food fortification policy**
- **Globally, pre-conceptional use of folic acid supplements is estimated to be low (<50% Ray et al., 2004)**
- **Scope for improving supplementation - potentially preventable NTD cases still occur each year (McGuire et al, 2010)**
- **Current research focus is on factors which are associated with high risk of not achieving optimal folic acid intake**



# Irish Research

- **Recent Irish studies on prevalence and predictors of folic acid (FA) use:**
  - Tarrant et al, 2011 - 88% of women took FA during pregnancy and 44% of took supplement before conception/during the 1st month of pregnancy (n=450).
  - McNulty et al, 2011 - 84% took FA during pregnancy, but only 19% before pregnancy (n=296); 'Red cell folate concentrations in women not complying with recommendations were suboptimal in relation to NTD risk'
  - McGuire et al, 2010 - 85% took FA at some point during the peri-conceptual period but only 28% took FA as recommended (N= 61, 252); antenatal and delivery records in the Coombe Women and Infants University Hospital between 1 January 2000 and 31 December 2007
- **Growing Up in Ireland is a nationally representative study of children in Ireland**
  - Provides data on children and their families *from different backgrounds*
  - Provides data on *maternal health behaviours* as well as *child and mother outcomes*
  - Provides an opportunity to obtain *recent prevalence rates* and *predictors* of folic acid use



# GUI and Folic Acid Use

- **Mothers were asked 2 questions regarding folic acid supplementation:**
  1. *Did you take folic acid/folate before becoming pregnant with the study child?*
  2. *Did you take folic acid/folate during the first trimester of pregnancy?*



# Initial Findings

- **Descriptive data:**
  - 63% of mothers reported taking folic acid before conception
  - 94% of mothers reported taking folic acid during the first trimester
- **For analysis, responses to both questions were recoded to create one variable ‘folic acid use’ with 3 categories:**
  1. Adequate use – reported use before *and* during pregnancy
  2. Sub-adequate use – reported use before *or* during pregnancy only
  3. Never used – reported not taking supplements before and during



# Prevalence of Folic Acid Use

Supplement use	Frequency	Percent	Valid Percent
Adequate Use	6736	60.7	61.8
Sub-Adequate Use (Before conception only)	117	1.1	1.1
Sub-Adequate Use (First trimester only)	3399	30.6	31.2
Never	654	5.9	5.9
Total	10906	98.3	100
Missing	190	1.7	
Total mothers	11096	100	



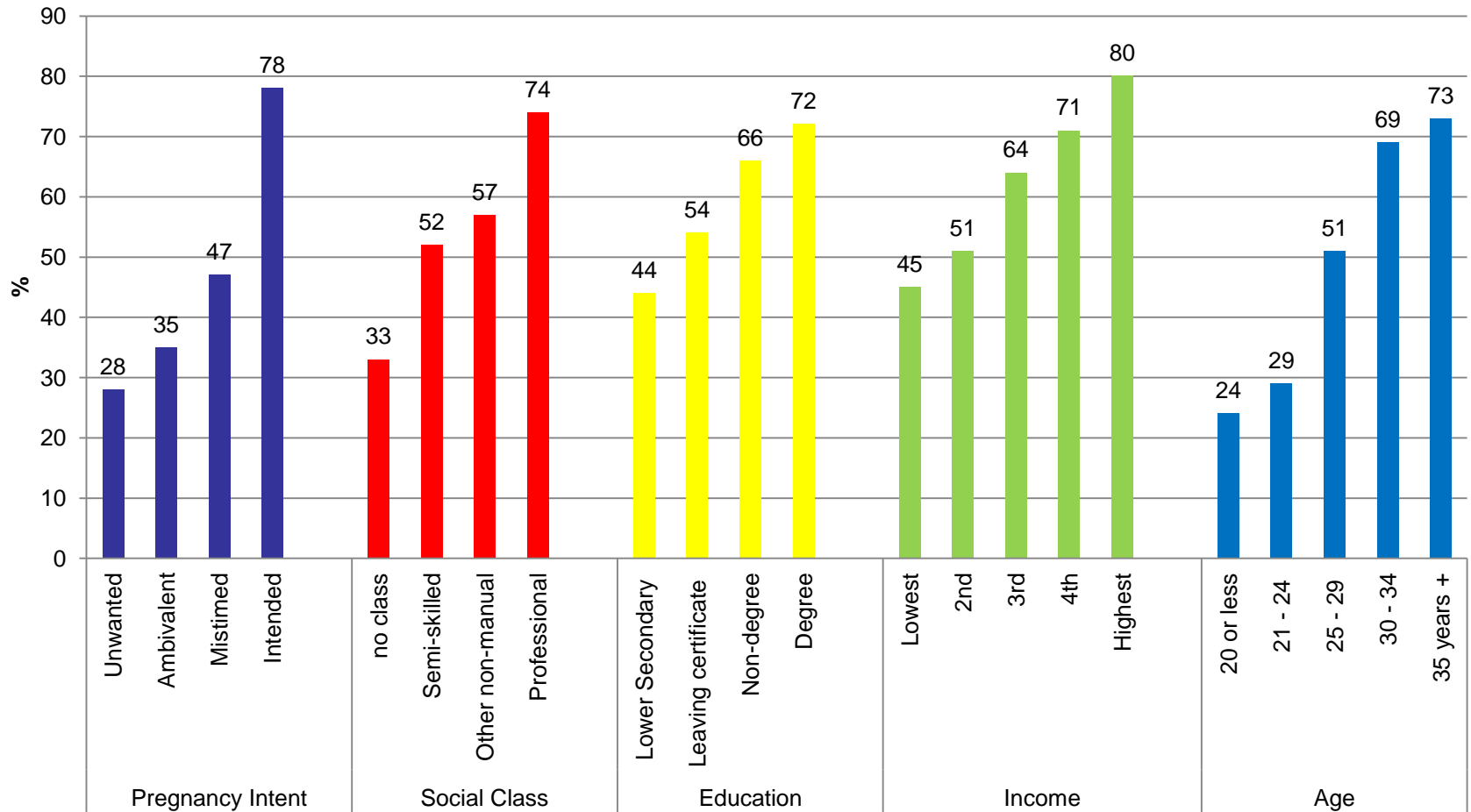


# Maternal Characteristics and Folic Acid Use

- **Trends in folic acid use by maternal characteristics:**
  - A greater percentage of mothers with higher income, education, age, and social class, and who an intended pregnancy, reported adequate folic acid use
  - See figure next slide for bivariate relationship between adequate folic acid use and classificatory variables: (1) pregnancy intention; (2) social class; (3) education; (4) income; and (5) age



# Trends in Adequate Folic Acid Use by Maternal Characteristics





# Predicting sub-adequate use and never taking folic acid

- **Multinomial logistic regression model:**
  - Used to examine association between maternal characteristics and mothers reports of *sub-adequate* folic acid use and *never* using folic acid
  - Reference category = *adequate* folic acid use
  - Size of the effect estimates given in odds ratios (ORs) with 95% confidence intervals (CI)
  - Statistical analyses were performed using SPSS version 18.0 for Windows (SPSS Inc, Chicago, IL, USA).



# Significant Predictors of Sub-Adequate Folic Acid Use

## **Pregnancy Intention:**

Mistimed pregnancy (OR 3.7, CI 3.316-4.176) Unwanted pregnancy (OR 4.7, CI 3.894-5.575)

Ambivalent pregnancy (OR 5.7 CI 4.703-6.792)

## **Age**

20 years of age or less (OR 2.3, CI 1.646-3.278) 21-24 years of age (OR 2.5, CI 2.019-3.036)

25-29 years of age (OR 1.8, CI 1.603-2.098)

## **Income**

Lowest Income (OR 1.3, CI 1.047-1.593) 2<sup>nd</sup> quintile (OR 1.6, 1.334-1.948), 3<sup>rd</sup> quintile (OR 1.3, CI 1.127-1.603) 4<sup>th</sup> quintile (OR 1.3, CI 1.071-1.494)

**Family type, ethnicity, full medical card cover, and smoking during pregnancy** also significantly predicted sub-adequate practices

\*Education and social class were significant – were not significant in the adjusted model



# Significant Predictors of Sub-Adequate Folic Acid Use

	Adjusted OR	CI Lower Bound	Upper Bound
Mistimed pregnancy	<b>3.7</b>	3.316	4.176
Unwanted pregnancy	<b>4.7</b>	3.894	5.575
Ambivalent pregnancy	<b>5.7</b>	4.703	6.792
Lowest Income	1.3	1.047	1.593
2 <sup>nd</sup> quintile	1.6	1.334	1.948
3 <sup>rd</sup> quintile	1.3	1.127	1.603
4 <sup>th</sup> quintile	1.3	1.071	1.494
Couple with 1 child	.8	.727	.922
20 years of age or less	<b>2.3</b>	1.646	3.278
21-24 years of age	<b>2.5</b>	2.019	3.036
25-29 years of age	<b>1.8</b>	1.603	2.098
Black/African ethnicity	1.6	1.123	2.211
Full medical card cover	1.2	1.044	1.409
Smoked during pregnancy	1.5	1.313	1.731



# Significant Predictors of Never taking Folic Acid

## **Pregnancy Intention:**

Mistimed pregnancy (OR 3.5, CI 2.693-4.476), Unwanted pregnancy (OR 7.7, CI 5.836-10.272), Ambivalent pregnancy (OR 6.6, CI 4.758-9.148)

## **Age:**

20 years of age or less (OR 3.1, CI 1.938-4.932), 21-24 years of age (OR 2.2, CI 1.588-3.141)

## **Income:**

Lowest Income quintile (OR 2.3, CI 1.417-4.009), 2<sup>nd</sup> quintile (OR 2.5, CI 1.501-4.123)

**Family type, ethnicity, full medical card cover, social class, education, and smoking and drinking during pregnancy** also significantly predicted never having taken folic acid supplements



# Significant Predictors of Never taking Folic Acid

	Adjusted OR	CI Lower Bound	CI Upper Bound
Mistimed pregnancy	<b>3.5</b>	2.7	4.5
Unwanted pregnancy	<b>7.7</b>	5.8	10.3
Ambivalent pregnancy	<b>6.6</b>	4.8	9.1
Lowest Income	<b>2.4</b>	1.4	4.0
2 <sup>nd</sup> quintile	<b>2.5</b>	1.5	4.1
Never Worked	1.8	1.2	2.7
Skilled/manual	1.7	1.2	2.4
Couple with 1 child	.6	.5	.8
Lower secondary school education	1.8	1.3	2.6
20 years of age or less	<b>3.1</b>	1.9	4.9
21-24 years of age	<b>2.2</b>	1.6	3.1
25-29 years of age	1.6	1.2	2.1
Other White Irish ethnicity	1.6	1.0	2.4
Black/African ethnicity	<b>2.1</b>	1.3	3.6
Asian ethnicity	<b>2.4</b>	1.3	4.5
Full medical card cover	1.4	1.1	1.9
Smoked during pregnancy	1.9	1.6	2.5
Drank alcohol during pregnancy	1.4	1.0	1.7
Mother not born in Ireland	.6	.4	.9



# Conclusion

- **62% of mothers reported adequate folic acid use, i.e. they took folic acid before pregnancy and during the first trimester of pregnancy - High percentage may reflect better supplementation practices**
- **Still a socially disadvantaged group of mothers who are most at-risk for inadequate folic acid intake**
- **This in keeping with findings from other studies that young women from socially disadvantaged backgrounds and minority ethnic groups are least likely to follow recommendations regarding folic acid use (Stockley and Lund, 2008).**
- **Pregnancy intention, age and income were the strongest predictors of sub-adequate folic acid use and of having taken no folic acid at all – awareness campaigns needed that target this group of at-risk mothers**





# Limitations

- **Retrospective reporting of maternal health behaviours may result in higher estimates than research conducted among women who are capable of becoming pregnant (Stockley & Lund, 2008)**
- **Timing and amount of folic acid supplementation during first trimester was not specified in this study – neural tube closes after day 28 so it is unlikely that taking folic acid after this has protective effects**
- **Mothers were not asked about awareness of folic acid supplementation campaigns – research on awareness would further contribute to our understanding of folic acid practices in Ireland**



# Directions for future research

- **Are there different determinants of *sub-adequate* folic acid use and *never* taking folic acid?**
  - Cluster analysis of maternal risk behaviours that go together may be useful in exploring possible processes underlying folic acid practices
- **Pregnancy intention is strongly associated with FA use and other maternal health behaviours – GUI provides potential to explore ways in which pregnancy intention may impact on child and mother outcomes**



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# Thank You

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