Executive Director of Public Health, Annual Report, 2011

The Early Years - building the blocks for future life
Acknowledgements

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I am pleased to present my first full Annual Report. This follows on from the publication of my interim report in March 2011 which described the health of the population of North Wales and highlighted the challenges for us to work together as a whole system to achieve a step change in health outcome.

In putting population health at the centre of all that we do, it is appropriate to focus on a life course approach. The life course, from pre conception to end of life will therefore form the framework for this and future annual reports.

There is currently much discussion on the provision of public services. It is therefore timely, in a local context, for my first full annual report to focus on the early years of life and the health experiences and outcomes for our babies, young children and their families. In so doing, I seek to remind us all that we each have a role to play in improving the health of our population and that many policies and services impact on health outcome.

My interim report highlighted the variation in health status and outcome that exist across our local communities. Such harm, variation and inequity can start before birth and continue through life.

A public health approach highlights the importance of understanding population need and applying the evidence of what works.

Over and over again, the published literature demonstrates that investing in the early years brings cost effective improvements quickly and sustainably at an individual, community and population level. Major reports continue to highlight the importance of a system approach to early intervention and prevention, targeted support for vulnerable families and responsibilities of policy makers, organisations, communities and individuals.

The current financial challenges also highlight the importance of using available resources wisely. Whilst there is a risk that we may wish to focus on the short term, the simple fact is that we cannot afford to ignore the evidence and the opportunity to improve health outcomes now and into the future.

In seeking to achieve sustainable improvements in health and well-being, it is absolutely essential therefore that we work together to invest time, energy and resources in the early years of life.

This challenge is not easy and requires partnership working focused ‘upstream’ on the determinants of health.

In this first and most important part of the life course our challenge is to work together for the benefit of a generation.

I am most grateful to Ms Siobhan Jones and Dr Angela Tinkler, who as joint editors of the report have brought together the contributions. My thanks also to colleagues in the wider editorial team including the local Public Health team and Public Health Observatory of Public Health Wales and colleagues from the Betsi Cadwaladr University Health Board and Local Authorities.

Andrew Jones
Executive Director of Public Health
Executive Summary
Executive Summary

The foundations for every aspect of human development are laid down during pregnancy and in early childhood.

As Director of Public Health, I have chosen to focus this, my first annual report on the early years of life because the evidence tells us that influencing the development of children to maximise their health, social and educational development is most effective when done as early as possible. There is also a strong economic case, as return on investment in the early years is higher than at any other stage of the life course.

Rates of stillbirth, preterm birth, low birth weight, neonatal deaths, admissions to neonatal units, infant mortality, child mortality, injuries and teenage pregnancy have all been shown to be significantly higher in areas with high levels of deprivation. Across North Wales we have described variation in health outcome and life experience. This includes the unacceptable variation of low birth weights of babies across our communities and the fact that babies born in the most deprived areas of North Wales could expect to die approximately seven years earlier than those born in the most affluent areas.

Giving every child the best start in life is the highest priority recommendation in Professor Sir Michael Marmot’s recent strategic review of health inequalities (Marmot 2010). His work highlights that this is the key to reducing health inequalities and creating a fairer society.

Achieving a sustainable improvement in health and well-being requires a systematic approach, with partners working together to implement and target interventions that are known to work. In bringing together the evidence base and health need data on maternal and child health outcomes in North Wales, this report highlights some key areas for action.
The NHS and partners need to work together to ensure:

- All women are supported to stop smoking in pregnancy through the systematic and coordinated implementation of evidence based public health interventions.
- Addressing maternal obesity is the highest priority aspect of any work on obesity.
- All maternity units and community providers achieve full UNICEF baby friendly accreditation as a minimum standard in order to maximise initiation and maintenance of breastfeeding.
- Evidenced based interventions to reduce teenage conceptions are implemented in a systematic and coordinated way.
- Target immunisation uptake rates are achieved for children and pregnant women.
- The pre-school healthy schools scheme and the new early years physical activity guidelines are implemented.
- Partnership working to achieve smoke free environments for children.
- Robust mechanisms exist to identify parental mental health issues as early as possible and facilitate referral to appropriate services and support.
- Equitable access to evidence based parenting programmes.
- A more integrated approach to supporting vulnerable families, with a strong emphasis on prevention and early intervention.
- Active Engagement in targeted partnership approaches such as Families First, Flying Start and Integrated Family Support.

Public health is about working in partnership for the benefit of the population. In this first part of the life course our collective aim is to ensure that babies are born healthy in North Wales and that pre-school children remain healthy, safe and develop to their full potential. It is intended that the information in this report will support organisations and partnerships to take forward this vital work through engagement with communities and families.

To note: some examples of local initiatives, through a series of case studies, have been included to reflect a range of initiatives that are seeking to address factors that cause poor health outcomes and health inequalities. However this does not necessarily represent an endorsement of these projects nor do they represent geographical coverage of projects and initiatives.
“Babies in North Wales are born healthy and preschool age children are healthy and develop to their full potential”
Chapter 1

The importance of the early years and the family
The importance of the early years and the family

Key Messages and Recommendations

• The foundations for every aspect of human development are laid down during pregnancy and in early childhood.

• Influencing the development of children to maximise their health, social and educational development is most effective when done as early as possible.

• There is a strong economic case for investing in the early years of life.

• Rates of stillbirth, preterm birth, low birth weight, neonatal deaths, admission to neonatal units, infant mortality, child mortality, injuries and teenage pregnancy have been shown to be significantly higher in areas with high levels of deprivation.

• Babies born in 2007-09 in the most deprived areas of North Wales could expect to die approximately seven years earlier than those born in the most affluent areas.

• The Local Public Health Strategic Framework has been developed in North Wales using a life course approach and sets out actions to improve the health of the population – this needs to be implemented in a systematic and coordinated way by partners.

• Services for women, children and families tend to take a reactive ‘fire-fighting’ approach to disease rather than proactively working to prevent ill health.

• There needs to be transformational change in the way all public sector services are delivered to families, ensuring prevention and early intervention approaches are embedded in any future service change and planning.
1.1 Introduction

The foundations for every aspect of human development are laid down during pregnancy and in early childhood. The health of babies can be affected before they are born, making it vitally important that pregnant women are healthy and safe and get the best support before and during their pregnancies.

The focus of this report is the health and well being of children in North Wales, but across Wales, children are not achieving the best outcomes when compared to other European countries, for example (Kennedy 2010, Marmot 2010, University of Salford 2007, Department of Health 2007, NHS Information Centre 2011, Centre for Maternal & Child Health 2010, Welsh Assembly Government 2011b Bradshaw et al 2010):

- Child mortality rates have fallen less quickly than in other developed countries.
- The UK has some of the highest rates of teenage pregnancy and low birth weight babies in Europe.
- The UK has recently been ranked bottom out of 25 industrialised countries for well being enjoyed by children.
- Children growing up in deprived circumstances have significantly poorer outcomes on almost every indicator of health and well being.
- Wales currently has the highest rate of smoking during pregnancy in the UK.
- Wales has the highest rate of obesity during pregnancy in the UK.
- Wales has the highest rate of women who drink before and during pregnancy in the UK.
- Wales performs poorly on measures of educational attainment when compared to the rest of the UK and other developed countries (see Appendix 1 for latest Programme for International Student Assessment (PISA) scores).

There is a strong body of evidence on the importance of the early years (Allen 2011, Kennedy 2010, Marmot 2010). In his recent report on health inequalities, Professor Sir Michael Marmot stresses that in order to give every child the best start in life, addressing inequalities and intervening early to prevent health problems must be prioritised (Marmot 2010).

Helping people make the best health choices for themselves now and for their children in the future is recognised as being vitally important.

It is for these reasons that the second Director of Public Health’s Annual Report will focus on the early years and the health experiences and outcomes for babies, young children and families in North Wales.
1.2 The importance of the early years

Influencing the development of children to maximise their health, social and educational development is most effective when done as early as possible. Brain development is most rapid before three or four years of age.

There is a strong economic case for investing in the early years of life. The rate of economic return on investment is significantly higher in the pre-school stage than at any other stage of the education system (see Figure 1). Despite this, investment in services for children and young people is often at its lowest in the very early years which are the most crucial in the development of the brain. Investment only increases at the point when development slows (see Figure 2).

Despite the current evidence, services for women, children and families tend to take a reactive ‘fire-fighting’ approach to disease rather than proactively working to prevent ill health. Decades of late intervention from health, education and social services have failed, but the right early intervention programmes can pay back their costs many times over (Allen 2011). There needs to be transformational change in the way all public sector services are delivered to families, ensuring prevention and early intervention approaches are embedded in any future service change and planning (Allen 2011, Royal College of Obstetricians & Gynaecologists 2011, Kennedy 2010, Marmot 2010).
Figure 1: Rates of return to investment in human capital as function of age when the investment was initiated


Figure 2: Public spending & brain research: the disconnect

Source: The Rand Corporation
1.3 Health inequality and the early years

It is well known that inequalities in health exist, with those living in deprived areas having poorer health outcomes in relation to almost every indicator of health and well-being. The pattern of deprivation in North Wales shows that the most deprived areas are found mainly in coastal areas such as Rhyl, Colwyn Bay, Caernarfon and Wrexham. Denbighshire has the highest percentage of lower super output areas (LSOA) in the most deprived fifth in Wales, and contains three out of the top five most deprived areas in Wales. Wrexham contains the second highest percentage of LSOAs in the most deprived fifth in Wales; Gwynedd has the lowest percentage of LSOAs in the most deprived fifth in Wales. Of the 425 LSOAs in North Wales, 12% are in the most deprived fifth Wales (Public Health Wales 2011a).

It is also important to consider the issue of rurality when considering the impacts of deprivation for the North Wales population. Large areas of North Wales are classed as rural with low population density. People living in these areas can be vulnerable to particular types of poverty such as poverty of participation and access to vital services.

Figure 3 details the impacts of the wider determinants of health; these wider determinants and socioeconomic circumstances have an important influence on the health and well-being of a population. The potential consequences of socioeconomic deprivation are multiple and complex (Public Health Wales 2010a).

Figure 3: Determinants of health and well-being

The health map

Source: Dahlgren & Whitehead
1.3.1 Impacts of deprivation on maternal and child health

There are well documented links between a number of key maternal, neonatal and child health indicators and deprivation. Rates of stillbirth, preterm birth, low birth weight, neonatal deaths, admissions to neonatal units, infant mortality, child mortality, injuries and teenage pregnancy have been shown to be significantly higher in areas with high levels of deprivation. Lifestyle factors are linked to deprivation and are an important contribution to health inequalities. Rates of smoking and obesity levels have been shown to be higher in areas with high levels of deprivation. Consumption of fruit and vegetables and levels of physical activity have been shown to be lower in areas with high level of deprivation (Public Health Wales 2010a).

Smoking, obesity and substance misuse during pregnancy are preventable causes of a significant proportion of morbidity and mortality for mothers and babies. Smoking and obesity in particular have a high prevalence in the population and can impact on rates of miscarriage, still birth, maternal death, neonatal death, admission to neonatal care and low birth weight. The impacts on the use of maternity and neonatal services are significant.

The graph below showing life expectancy at birth for male babies born in North Wales, gives an illustration of some of the inequality in health outcomes that currently exist. It can clearly been seen that a considerable gap exists, and that babies born in 2007-09 in the most deprived areas of North Wales could expect to die approximately seven years earlier than those born in the most affluent areas.

Figure 4: Life expectancy at birth, males, Betsi Cadwaladr UHB and Wales, 2001-09
1.4 Key actions for the early years

As part of the five year strategic planning process, a Local Public Health Strategic Framework has been developed in North Wales using a life course approach and sets out actions to improve the health of the population. In relation to the early years the high level aims are to ensure babies are born healthy in North Wales and that pre-school children are healthy, safe and develop to their full potential. This report will describe some of the partnership working that is happening across North Wales to contribute to achieving this vision. The table below sets out some of the key high level actions for the early years and the anticipated outcomes of implementing these actions in a coordinated way across North Wales.
<table>
<thead>
<tr>
<th>ACTION</th>
<th>IMPACT</th>
</tr>
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<tbody>
<tr>
<td>Improve preconception advice</td>
<td>• Reduced infant mortality</td>
</tr>
<tr>
<td></td>
<td>• Fewer low birth weight babies</td>
</tr>
<tr>
<td></td>
<td>• Reduced congenital anomalies</td>
</tr>
<tr>
<td>Increase early uptake of ante-natal services</td>
<td>• Reduced infant mortality</td>
</tr>
<tr>
<td></td>
<td>• Improved safeguarding</td>
</tr>
<tr>
<td></td>
<td>• Fewer low birth weight babies</td>
</tr>
<tr>
<td>Increase breastfeeding uptake</td>
<td>• Reduced infant mortality</td>
</tr>
<tr>
<td></td>
<td>• Reduced childhood obesity</td>
</tr>
<tr>
<td></td>
<td>• Improved oral health</td>
</tr>
<tr>
<td></td>
<td>• Reduced hospitalisation for infections</td>
</tr>
<tr>
<td></td>
<td>• Reduced female cancers</td>
</tr>
<tr>
<td>Improve access to dentistry</td>
<td>• Improved oral health</td>
</tr>
<tr>
<td></td>
<td>• Reduced hospitalisation</td>
</tr>
<tr>
<td>Reduced alcohol/drug abuse</td>
<td>• Improved safeguarding</td>
</tr>
<tr>
<td></td>
<td>• Reduced infant mortality</td>
</tr>
<tr>
<td></td>
<td>• Reduced childhood obesity</td>
</tr>
<tr>
<td></td>
<td>• Reduced hospitalisation</td>
</tr>
<tr>
<td>More support on parenting</td>
<td>• Improved mental well being</td>
</tr>
<tr>
<td></td>
<td>• Better school-readiness</td>
</tr>
<tr>
<td>Reduced teenage pregnancy</td>
<td>• Reduced infant mortality</td>
</tr>
<tr>
<td></td>
<td>• Fewer low birth weight babies</td>
</tr>
<tr>
<td></td>
<td>• Reduced childhood injuries</td>
</tr>
<tr>
<td>Improved immunisation rates</td>
<td>• Reduced hospitalisation</td>
</tr>
<tr>
<td></td>
<td>• Reduced epidemic risk</td>
</tr>
<tr>
<td>Reduced smoking prevalence</td>
<td>• Reduced infant mortality</td>
</tr>
<tr>
<td></td>
<td>• Raised life-expectancy</td>
</tr>
<tr>
<td></td>
<td>• Reduced hospitalisation</td>
</tr>
<tr>
<td></td>
<td>• Improved fire safety</td>
</tr>
</tbody>
</table>
Chapter 2

Getting the best start
Key Messages and Recommendations

• There is stark geographical variation in low birth weight rates in North Wales, linked to areas of high socioeconomic deprivation.
• Maternal smoking, maternal nutrition, young maternal age and substance misuse are important risk factors for low birth weight.
• Mothers in Wales are more likely to smoke in pregnancy and less likely to give up than in any other UK country.
• High quality evidence exists to support interventions to reduce maternal smoking. Succeeding on this one issue alone would have a substantial impact on the long term health of the children of North Wales and should be a high priority area for public health action for NHS and partners.
• Obesity in pregnancy is currently one of the biggest threats to maternal and child health in developed countries. Women in Wales are more likely to be obese during pregnancy than in any other UK country. Due to the high level of harm to mother and baby, maternal obesity should be the highest priority aspect of any work on obesity being taken forward by NHS or partners.
• The UK has the highest rates of under-18 pregnancy in Western Europe and Wales has a higher rate of teenage conceptions than England. The evidence base on interventions to reduce teenage pregnancy should be implemented in a systematic and coordinated way by partners.
• Breastfeeding saves lives and protects the health of mothers and babies. The UK has the lowest breastfeeding rate in Western Europe and North Wales has lower breastfeeding rates than the UK.
• High quality evidence exists to support interventions to increase the uptake and maintenance of breastfeeding. All maternity units and community providers should work to achieve full UNICEF baby friendly accreditation as a minimum standard.
• Communication is the most important and fundamental life skill, and forms the basis on which all children learn and achieve. Competence in spoken language is crucial for later academic success, positive self esteem and improved life chances. Early identification and timely support is critical to ensure that infants reach their potential.
2.1 Infant mortality – why it is important

Infant mortality is a measure of the rate of deaths in children aged less than one year. It gives a good indication of the overall health of children in a country or region and is strongly influenced by the health of mothers before, during and after pregnancy.

During the period 2004 to 2008, the infant mortality rate in North Wales and Wales was 4.5 per 1,000 births. The most common cause of infant deaths was premature birth (All Wales Perinatal Survey 2008).

 Whilst there is variation in these measures at a Local Authority level in North Wales, there is no Local Authority area that has mortality that is statistically significantly above the average for Wales.

Table 1: Infant mortality rate per 1,000 births, North Wales, 2004-2008

<table>
<thead>
<tr>
<th></th>
<th>Rate per 1,000 births</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wales</td>
<td>4.5</td>
<td>(4.2  4.8)</td>
</tr>
<tr>
<td>North Wales</td>
<td>4.5</td>
<td>(3.9  5.3)</td>
</tr>
<tr>
<td>Isle of Anglesey</td>
<td>4.9</td>
<td>(3.1  7.9)</td>
</tr>
<tr>
<td>Gwynedd</td>
<td>4.5</td>
<td>(3.1  6.5)</td>
</tr>
<tr>
<td>Conwy</td>
<td>5.4</td>
<td>(3.8  7.7)</td>
</tr>
<tr>
<td>Denbighshire</td>
<td>4.4</td>
<td>(2.9  6.7)</td>
</tr>
<tr>
<td>Flintshire</td>
<td>4.5</td>
<td>(3.3  6.1)</td>
</tr>
<tr>
<td>Wrexham</td>
<td>3.8</td>
<td>(2.7  5.5)</td>
</tr>
</tbody>
</table>

Source: NCCHD & AWPS

Addressing infant mortality is vital because of the loss of life and the devastating effect these deaths have on the parents, families and communities. It is also an important indication of more general ill-health in mothers and families, as for every death there will be other children who survive but suffer long-term ill-health and/or disability.
2.1.1 What works to reduce infant mortality?

Infant mortality is closely associated with poverty and deprivation, and improving family income is known to be the most effective way of preventing it (Department of Health 2007). Other interventions to help reduce infant mortality are outlined in other parts of this report; however the best evidence is for the following:

- Improved pre-pregnancy and antenatal advice, screening and care and early booking with a midwife.
- Reducing or stopping smoking during pregnancy.
- Help with breastfeeding, improved nutrition and healthy choices in pregnancy.
- Identifying pregnancies with increased risks for both mother and baby and providing appropriate additional services for these.
- Good quality obstetric and neonatal services.
- Reducing teenage pregnancies and targeting support for teenage mothers.

Figure 5 shows the likely impact of specific interventions in relation to reducing the inequality gap known to exist in infant mortality rates.

**Figure 5: Identifiable actions to reduce the 2002-04 gap in infant mortality**

<table>
<thead>
<tr>
<th>What would work</th>
<th>Impact on the 2002-04 gap (percentage point)</th>
<th>What would work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing conceptions in under 18s in by the Routine and Manual (R&amp;M) group 44% to meet the target</td>
<td>1.0</td>
<td>Reducing overcrowding in the R&amp;M groups through its effect on SUDI</td>
</tr>
<tr>
<td>Target intervention to prevent SUDI by 10% in the R&amp;M group</td>
<td>1.4</td>
<td>Reducing the rate of smoking in pregnancy by two percentage points by 2011</td>
</tr>
<tr>
<td>Reducing the prevalence of obesity in the R&amp;M group to 2.3%</td>
<td>2.0</td>
<td>Meeting the child poverty strategy</td>
</tr>
<tr>
<td>Increasing the rate of breastfeeding initiation in the R&amp;M groups to those of the non R&amp;M groups from 67% to 83%</td>
<td>2.8</td>
<td>Long term actions</td>
</tr>
<tr>
<td></td>
<td>2.8</td>
<td>Improving maternal education attainment</td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.0</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Adapted from Department of Health 2007*
2.2 Low birth weight

Low birth weight, when a baby is born weighing less than 2500g, is caused by either premature birth or failing to grow in the womb (or a combination of both). Britain has the worst rate of low birth weight babies of any country in Europe except Greece (UNICEF 2007).

In Wales, there is a clear link between low birth weight and socio-economic deprivation: the highest rate is in the poorest areas and it is almost twice the rate found in those areas with the lowest rates of low birth weight (Public Health Wales 2010b). This is an example of health inequality. Low birth weight is so strongly connected with poor health and deprivation that it is sometimes used as a general measure of poverty in a community.

The proportion of babies born with a low birth weight is slightly higher than a decade ago. This increase in low birth weight babies can been partly explained by improved medical technologies, resulting in more successful deliveries of low birth weight babies, and increased fertility treatment which is more likely to lead to a low birth weight baby. The percentage of low birth weight births in North Wales (5.5%) is slightly lower than the average for Wales (5.8%); however there is considerable variation across North Wales. Across Middle Super Output Areas (MSOA) in North Wales, covering an average population size of 7,500, there are six areas that have a percentage of low birth weight births that is statistically significantly higher than the average for Wales. There is stark geographical variation in low birth weight rates in North Wales, linked to areas of high socioeconomic deprivation. The highest percentage of low birth weights in North Wales is in MSOA Denbighshire 006 (Rhyl South West) at 8.2%, compared to the lowest percentage, 2.9%, found in Conwy 003 (Llandrillo yn Rhos) (Public Health Wales 2010a).
Figure 6: Low birth weight, 1998-2007, all singleton live births, Middle Super Output Areas North Wales

MSOAs significantly higher than overall % for Wales

<table>
<thead>
<tr>
<th>Label</th>
<th>MSOA Name</th>
<th>Annual Average</th>
<th>% Low Birth Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Denbighshire 006</td>
<td>7</td>
<td>8.2</td>
</tr>
<tr>
<td>5</td>
<td>Flintshire 007</td>
<td>6</td>
<td>8.1</td>
</tr>
<tr>
<td>4</td>
<td>Wrexham 010</td>
<td>9</td>
<td>7.5</td>
</tr>
<tr>
<td>3</td>
<td>Gwynedd 006</td>
<td>8</td>
<td>7.5</td>
</tr>
<tr>
<td>2</td>
<td>Flintshire 009</td>
<td>9</td>
<td>7.4</td>
</tr>
<tr>
<td>1</td>
<td>Denbighshire 004</td>
<td>9</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Numbers on map indicate MSOAs with a rate statistically significantly higher than the all Wales rate.
Low birth weight is a major cause of infant mortality in developed countries including the UK. Babies born weighing less than 2500g are more likely to die or suffer poor health. In addition, low birth weight can lead to chronic diseases such as diabetes and coronary heart disease in adulthood.

Maternal smoking, poor maternal nutrition and excessive alcohol or drug consumption during pregnancy are causes of low birth weight (Public Health Wales 2010b). Smoking is a major modifiable risk factor contributing to low birth weight, and other people smoking around a pregnant woman adds to the risk.

A number of nutritional factors also have an influence on low birth weight, including pre-pregnancy maternal weight, gestational weight gain, energy intake, iron and anaemia. Young maternal age is also known to contribute to the risk of having a low birth weight baby, with rates higher among teenage mothers (Department of Health 2010, Welsh Assembly Government 2011c).

2.2.1 What works to reduce rates of Low Birth Weight?

Actions recommended to help reduce rates of low birth weight are similar to those listed for infant mortality, with a particular focus on:

- Smoking cessation advice and support before and during pregnancy to help women and their partners stop smoking quit and for the home environment to remain smoke free.
- Advice on healthy eating and alcohol consumption/drinking before, during and after pregnancy.
- Specialist support to women who misuse substances.
- Interventions to reduce teenage conceptions.
2.3 Preconception advice and support – why it is important

It is vital for women to be healthy at the start of pregnancy. This will significantly impact on the outcome of the pregnancy for both mother and baby. This is also an important factor in the delivery of maternity services as healthy women are more likely to stay on midwifery led care pathways during pregnancy, labour and delivery and are less likely to require caesarean section and admission to neonatal intensive care units.

Many health factors in pregnancy are difficult to address once a pregnancy has started. It is more effective if advice and behaviour change occur before conception; these include:

- Advice on vitamin D and taking folic acid supplements prior to conception and for the first 12 weeks of pregnancy to prevent neural tube defects;
- importance of abstaining from smoking, alcohol and substance misuse whilst trying to conceive and during pregnancy;
- being a healthy weight before starting a pregnancy;
- checking rubella immunisation status;
- advice about individual health and genetic conditions; and general advice about when and how to get help as soon as pregnancy starts.

Whilst this advice is available from all GPs, midwives and health visitors there is a need for more proactive targeting of this advice to those who need it most, in a format that is accessible and easily understood.

The latest Centre for Maternal and Child Enquiries report on maternal deaths (Centre for Maternal and Child Enquiries 2010) highlights the benefits of providing targeted support and pre-pregnancy counselling to women at high risk of complications in pregnancy. Women with epilepsy, obesity, known significant mental ill health and congenital heart disease were highlighted as specific examples of women who could benefit from this approach.
2.4 Teenage pregnancy

Pregnancy can be a positive life choice for many teenagers; however, for many it is unplanned and can be associated with negative health outcomes for both mother and baby. Young mothers are more likely to suffer postnatal depression and less likely to complete their education. Children born to teenage parents are less likely to be breastfed, more likely to live in poverty and are twice as likely to become teenage parents themselves.

The UK has the highest rates of under-18 pregnancy in Western Europe. Half of all under-18 conceptions occur in the 20% most deprived wards in the UK (Teenage Pregnancy Associates 2011).

Wales has a higher rate of teenage conceptions among 15 to 17 year olds than England, 40.1 per 1,000 females aged 15 to 17 years in Wales compared to 38.2 per 1,000 in England.

In North Wales in 2009, there were 524 conceptions to females aged 15 to 17 years. The Isle of Anglesey has the highest under-18 conception rate in North Wales: 46.8 per 1,000; only Flintshire has a teenage conception rate lower than the average for Wales. When considering data, such as that on teenage conceptions, where numbers are often small, it is important not to rely on single year data which can vary considerable year to year, but also consider trend data. Table 3 shows the trend in conceptions since 2001.

Table 2: Teenage conception rate per 1,000 females aged 15 to 17 years, 2009

<table>
<thead>
<tr>
<th></th>
<th>Conception rate per 1,000 females aged 15-17 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isle of Anglesey</td>
<td>46.8</td>
</tr>
<tr>
<td>Gwynedd</td>
<td>42.6</td>
</tr>
<tr>
<td>Conwy</td>
<td>41.0</td>
</tr>
<tr>
<td>Denbighshire</td>
<td>43.6</td>
</tr>
<tr>
<td>Flintshire</td>
<td>32.2</td>
</tr>
<tr>
<td>Flintshire</td>
<td>44.2</td>
</tr>
<tr>
<td>Wales</td>
<td>40.1</td>
</tr>
<tr>
<td>England</td>
<td>38.2</td>
</tr>
</tbody>
</table>

Source: ONS
For pregnancies under the age of 16, there is a different geographical pattern and Wrexham tends to have the highest rates. However annual statistics for numbers of under 16 pregnancies are usually small and therefore there is much variation from year to year. Some teenage pregnancies are planned, but most are not and around half of teenage pregnancies end in abortion.

### Table 3: Teenage conception rate per 1,000 females aged 15 to 17 years, 2001-2008

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
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<td>36.0</td>
<td>34.8</td>
<td>34.0</td>
<td>32.5</td>
<td>31.1</td>
<td>40.9</td>
<td>36.8</td>
<td>41.5</td>
</tr>
<tr>
<td>Gwynedd</td>
<td>44.1</td>
<td>47.0</td>
<td>34.6</td>
<td>38.0</td>
<td>40.5</td>
<td>43.3</td>
<td>49.3</td>
<td>38.1</td>
</tr>
<tr>
<td>Conwy</td>
<td>38.3</td>
<td>41.5</td>
<td>53.4</td>
<td>49.3</td>
<td>49.4</td>
<td>52.6</td>
<td>40.2</td>
<td>43.4</td>
</tr>
<tr>
<td>Denbighshire</td>
<td>37.3</td>
<td>40.8</td>
<td>42.8</td>
<td>50.5</td>
<td>44.7</td>
<td>42.6</td>
<td>49.8</td>
<td>48.6</td>
</tr>
<tr>
<td>Flintshire</td>
<td>38.7</td>
<td>40.4</td>
<td>35.5</td>
<td>37.5</td>
<td>40.5</td>
<td>34.2</td>
<td>41.2</td>
<td>35.8</td>
</tr>
<tr>
<td>Wrexham</td>
<td>40.6</td>
<td>44.9</td>
<td>55.8</td>
<td>62.2</td>
<td>62.5</td>
<td>58.8</td>
<td>43.9</td>
<td>46.9</td>
</tr>
<tr>
<td>Wales</td>
<td>45.5</td>
<td>46.0</td>
<td>45.7</td>
<td>45.0</td>
<td>43.6</td>
<td>45.0</td>
<td>44.9</td>
<td>44.3</td>
</tr>
</tbody>
</table>

Source: ONS
2.4.1 What works to help reduce unplanned teenage pregnancy?

There is evidence that the following can help reduce unplanned teenage pregnancy:

- School-based sex and relationships education, particularly when it is linked to contraceptive services, can delay sexual activity and reduce pregnancy rates.
- Interventions tailored and delivered to a particular group of adolescents by trained facilitators are associated with a decrease in sexual risk behaviours.
- One-to-one interventions based on psychological behaviour change theories provided by sexual health professionals.
- Ensuring easy access to services providing a choice of contraceptive methods, including long-acting reversible methods.
- Improving confidentiality, accessibility and a welcoming environment can encourage uptake of services by young people.
- Condom card schemes to broaden access to free condoms.

Case study:

Project Jiwsi – targeting young people at greatest risk of poor sexual health

Project Jiwsi is a sexual health and self-esteem project for vulnerable young people, delivered by the charity FPA (formerly Family Planning Association) on behalf of the Health Board. It is delivered in non-mainstream settings across North Wales. The children and young people targeted can be vulnerable because of a physical or learning disability, sensory impairment, being in local authority care, being homeless, having behaviour which puts them at risk, or any other vulnerability. The project has four strands:

- Three project staff deliver tailored programmes (usually 8-10 weekly sessions) of education to small groups of children or young people from agencies across the six counties.
- Every year 16 staff from statutory and other voluntary agencies are given free accredited training to deliver the same style and quality of work.
- Graduates of the Jiwsi course and others have formed a network to meet and share good practice.
- A bilingual book of teaching materials has been produced and is available to download.

The project has run successfully and at full capacity since being established in 2002. It is a good example of partnership working between the Health Board and specialist expertise from the voluntary sector. Between April 2010 and March 2011, 54 groups were operational and services were provided to 547 young people.
2.5 Maternal smoking - why it is important

In 2010 around a quarter (26%) of mothers in the UK smoked directly before or during their pregnancy. Smoking levels before or during pregnancy were highest in Wales (33%) and lowest in England (26%). Across the UK, one in eight mothers (12%) continued to smoke throughout pregnancy, and were still smoking after the baby was born. Mothers in Wales were most likely to smoke throughout their pregnancy (16%) (NHS Information Centre 2011).

The smoking habits of teenage girls are a particular cause for concern as smoking rates in this group continue to increase despite a downward trend in all other areas. Pregnant women are also at risk from other people smoking, especially in the home and in cars: 20% of non-smoking adults are exposed to second hand tobacco smoke.

The risks of smoking in pregnancy include miscarriage, perinatal death, prematurity, low birth weight and congenital anomalies in the baby in particular of the heart, face and limbs.

Case study:

developing a smoking in pregnancy service

Professionals from Betsi Cadwaladr University Health Board’s maternity and child health services, Public Health Wales and Stop Smoking Wales have come together to develop a service for pregnant women who smoke. Bespoke training for midwives, health visitors and support staff has been developed and an evidence based (National Institute for Clinical Excellence 2010a) referral pathway is now in place to support the referral of women from maternity services to Stop Smoking Wales. Regular training sessions now take place across North Wales and are very well attended and referrals into Stop Smoking Wales are increasing.
2.5.1 What can we do to reduce maternal smoking?

- Healthcare professionals who work with pregnant women and their partners need to be trained to deliver brief interventions about stopping smoking, including referring them to Stop Smoking Wales.
- Accelerated one-to-one service for pregnant women and their partners.
- Tobacco education in schools should include additional booster activities until school leaving age.

High quality evidence exists to support interventions to reduce maternal smoking and this needs to be implemented in a coordinated and systematic way by all frontline staff delivering services to pregnant women and their families. Due to the level of harm caused by smoking, interventions to support women to stop smoking in pregnancy are always cost effective for the NHS. Succeeding on this one issue alone would have a substantial impact on the long term health of the children of North Wales and should be one of the highest priority areas for public health action for the NHS and partners.
2.6 Maternal obesity – why it is important

Body mass index (BMI) is a measurement comparing weight to height, with obesity being defined as a BMI over 30. The 2010 Centre for Maternal and Child Enquiries report Maternal Obesity in the UK found that 6.5% of pregnant women in Wales had a BMI of 35 or more, compared to the UK average of 5%. Wales has the highest prevalence of maternal obesity of all the UK countries (Centre for Maternal and Child Enquiries 2010). Obesity in pregnancy is currently one of the biggest threats to maternal and child health in developed countries. Women who are obese are more than twice as likely to have a stillborn baby, and the risk increases with increasing maternal BMI. Babies born to obese mothers are less likely to be breast fed, more likely to have congenital anomalies, especially neural tube defects, and to require admission to neonatal units. It is also more difficult to monitor the health of these babies during pregnancy and birth.

The mother’s health is also at risk, as they are more likely to have pregnancy-related complications such as gestational diabetes, pre-eclampsia, haemorrhage following birth, thromboembolism and deliver their babies by caesarean section.

The prevalence of obesity can be intergenerational, as women who are obese during pregnancy are more likely to have obese children. When these children enter adulthood and possible pregnancies, they too face the increased risk of health problems associated with obesity (World Health Organisation 2007).

2.6.1 What works to reduce maternal obesity and its associated risks?

- Pre-pregnancy counselling and support provided to women of childbearing age with a BMI over 30 together with information about the increased risks associated with obesity and how to minimise them.
- Supplementation of routine ante-natal care with specialist services and facilities as required.
- Height, weight and body mass of pregnant women measured and recorded without reliance on self-reported measures.
- Surveillance and screening for foetal abnormalities and pregnancy complications should follow available guidelines.
- An antenatal anaesthetic consultation is advised for women with a BMI over 40 and may also be required for other women together with consideration of type and place of birth.
- Risk of thromboembolism should be assessed early and preventive treatment provided according to guidelines.
- Links should be maintained with local weight management services and referral pathways developed for preconception, antenatal and postnatal care.
- Although breastfeeding rates are lower among women with high BMI, breastfeeding can help with postnatal weight reduction and has a protective effect for the baby in relation to future risk of childhood obesity and obesity in adulthood.
Breastfeeding saves lives and protects the health of mothers and babies. Breastfed babies are less likely to have to go to hospital with infections, and are more likely to grow up with a healthy weight and without allergies. Mothers who breastfeed are protected against some cancers. Breastfeeding is free and costs less for the family and also saves the health service money as babies stay healthier.

The 2010 Infant Feeding Survey found 71% of mothers in Wales reported breastfeeding compared to 81% across the UK. As with previous years, the 2010 Survey found a clear association between breastfeeding and socio-economic status. Incidence of breastfeeding remains highest in the least deprived groups (NHS Information Centre 2011).

Breastfeeding rates in the UK are amongst the lowest in Europe, with about 66% of women starting breastfeeding, falling rapidly after a few days. There are considerable variations in breastfeeding rates, with older, better-educated and higher social class women being more likely to breastfeed, and full-term, heavier babies more likely to be breastfed.

The World Health Organisation recommends that babies should be exclusively breast-fed until six months old, but many women do not breastfeed either out of choice or because they experience problems with it. Many mothers start breastfeeding but do not continue.

In 2009, 59% of mothers in North Wales reported breastfeeding at birth. Reliable figures for breastfeeding continuation are limited, but most mothers stop well before the recommended six month minimum. There is considerable variation across North Wales in the rates of starting and continuing breastfeeding.

The Welsh Assembly Government breastfeeding strategy Investing in a Better Start: promoting breastfeeding in Wales provides detailed guidance on evidence-based ways to improve breastfeeding, including shifting culture and attitudes among the public and health professionals, education for relevant staff, information and education in schools and development of local strategies to address local issues impeding breastfeeding (Welsh Assembly Government 2001).

High quality evidence exists to support interventions to increase the uptake and maintenance of breastfeeding (National Institute of Health and Clinical Excellence 2007a). All maternity units and community providers should work to achieve full UNICEF baby friendly accreditation as a minimum standard. There is also good evidence to support peer support approaches to breastfeeding. Access to peer support is variable across North Wales, but where these initiatives are in place they are reported to be working well to support breastfeeding mothers. Due to the overwhelming health benefits, interventions to support breastfeeding are cost effective (National Institute of Health and Clinical Excellence 2007a).
2.7.1 What works to help increase uptake and continuation of breastfeeding?

- 24-hour access for mothers to good breastfeeding advice and support for at least four months following delivery.
- Full implementation of the UNICEF Baby-friendly initiative across all sites to achieve a systematic programme of training and policies for staff which promote breastfeeding.
- Further promotion across local partnerships of the Welsh Government Breastfeeding Welcome Scheme in cafes, restaurants, public buildings and other areas where mothers may need to feed their babies when away from home. Improved collection of data will help to measure progress and identify problem areas where more help is needed.
- Education on the importance and benefits of breastfeeding through the school system at appropriate key stages as part of the focus on preparing for parenthood.

Case study: the volunteer breastfeeding peer support scheme in Wrexham

The role of the volunteer breastfeeding peer supporter is to support new mothers to initiate and continue breastfeeding. Between October 2010 and April 2011 there have been 20 peer supporters trained and they are currently working in Wrexham Flying Start areas. The breastfeeding rates in these areas are historically lower than other areas of Wrexham.

In 2010 data showed that 75% of patients who had initiated breastfeeding at birth had given up before their post natal visit. As a result of this finding, clients are visited by the breast feeding co-ordinator ante-natally and they are referred to a local peer support volunteer who is able to provide support and advice both before and after the birth with the aim of increasing both initiation and continuation rates.

For example, one peer supporter has successfully supported her sister in law with breastfeeding her second child after encountering difficulties breastfeeding her first child. This time she has been helped with overcoming engorgement and been taught how to hand express and feels much more positive about breastfeeding.

A future planned development is the introduction of peer supporter visiting to the Post Natal wards in Wrexham Maelor hospital as from September 2011.
Communication is one of the most important and fundamental life skills, and forms the basis on which all children learn and achieve. In the early years, children’s communication environment is a better predictor of their success with speech and language skills than their general social background. Parents that provide a positive communication environment for their children from the very start of their lives can have a significant impact on how their children learn to talk (Law, 2011).

Competence in spoken language is crucial for later academic success, positive self esteem and improved life chances (Snow and Powell, 2004). Speaking and listening together with reading and writing are prime communication skills central to children’s intellectual, social and emotional development (Rose, 2006).

However, between 1-8% of children have long-term, persistent Speech, Language and Communication Needs (SLCN) which need specialist help.

Without the right help, infants with communication difficulties are likely to find it harder to learn, integrate into society, make friends and reach their academic potential. They may become isolated and frustrated – increasing the risk of poor behaviour, mental health issues and offending (ICAN 2006).

For those infants with communication and language difficulties, targeted support through services (health, education and social care), as well as parental advice is a vital aspect of helping to ensure that they develop to their full potential.
2.8.1 What can we do to promote speech, language and communication development?

Consistent advice to all parents on the importance of positive interaction, talking and reading with infants and toddlers is a vital aspect of Early Years interventions (Department of Health 2009, NHS Health Scotland 2011).

In addition to this, for infants with communications difficulties to reach their full potential, it is essential for their needs to be identified early and for them to receive timely support from health, education and social care services, working in partnership.

One example of early intervention is newborn hearing screening. Hearing impairment can present a significant barrier to speech and language development. Early detection leads to improved outcomes and to improvements in the general well being of the child and family.

Wales has a national newborn hearing screening programme in place, the aim of which is to identify babies with hearing impairment and intervene with appropriate help and support which will enable the child to develop better language and communication skills.

## Case study:

**Newborn hearing screening programme**

Through the All Wales Screening Programme 99.9% of eligible babies were offered screening and 99.7% tested, with very few parents declining. The coverage rates for Newborn Hearing are consistently well above the standard rate for all of the unitary authorities in Betsi Cadwaladr UHB. In fact the rate is excellent with all unitary authorities achieving close to 100% uptake rate.

### Table 4: Coverage of Newborn Hearing of eligible babies, North Wales, 1st April 2009 to 31st March 2010

<table>
<thead>
<tr>
<th></th>
<th>Number tested</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wales</td>
<td>33,455</td>
<td>99.7</td>
</tr>
<tr>
<td>North Wales</td>
<td>7,434</td>
<td>99.9</td>
</tr>
<tr>
<td>Isle of Anglesey</td>
<td>699</td>
<td>100</td>
</tr>
<tr>
<td>Gwynedd</td>
<td>1,245</td>
<td>100</td>
</tr>
<tr>
<td>Conwy</td>
<td>1,102</td>
<td>100</td>
</tr>
<tr>
<td>Denbighshire</td>
<td>1,019</td>
<td>99.9</td>
</tr>
<tr>
<td>Flintshire</td>
<td>1,712</td>
<td>99.9</td>
</tr>
<tr>
<td>Wrexham</td>
<td>1,657</td>
<td>99.8</td>
</tr>
</tbody>
</table>

*Source: Public Health Wales*
Protecting Health

Key Messages and Recommendations

• Immunisation is a cost effective intervention which saves lives. The immunisation target uptake rates of 95% are not being achieved in all areas of North Wales.
• MMR uptake rates are improving, but still fall short of the 95% target required to achieve herd immunity. Some children are starting school without receiving two doses leaving communities at risk of outbreaks of measles.
• Pregnant women are more at risk of developing complications from seasonal flu infection consequently all pregnant women are now offered seasonal flu immunisation. Uptake of this in North Wales last year was below 50%. Health services need to have robust systems in place to ensure a high uptake of the flu vaccination among pregnant women.
• Childhood obesity is a significant public health issue in Wales, 22% of school children in the Reception Class measured as being overweight or obese.
• NHS and partners should be implementing initiatives to improve healthy eating and physical activity in pre-school children. The pre-school healthy schools scheme and new early years physical activity guidelines should be supported and implemented across North Wales.
• Exposure to second hand tobacco smoke is associated with significant ill health in childhood and high costs to the NHS. Smoke free environments for children and support to parents to stop smoking should be a high priority for NHS and partners.
• Children living in deprived areas of North Wales have worse oral health. NHS and partners should engage in targeted initiatives to improve oral health such as Designed to Smile.
• Injuries are a key cause of death and disability among children. Partnership working in relation to implementing the evidence base on injury prevention needs to be strengthened.
### 3.1 Childhood immunisation

The widespread implementation of immunisation programmes over the past 30 years has led to a dramatic reduction in illness and death due to vaccine-preventable diseases. To prevent outbreaks of vaccine preventable disease, high coverage levels of 95% and above must be maintained.

Despite the increase in uptake of the routine childhood vaccinations, the vaccination target of 95% is still not being achieved in all areas of North Wales (see Appendices for the full schedule of childhood vaccinations and details of coverage in North Wales).

**Figure 7: Uptake of childhood immunisations, North Wales, Quarter One 2004 to Quarter Two 2010**

![Graph showing the uptake of childhood immunisations](image)

Source: Public Health Wales

There are small areas across North Wales which are not achieving the target immunisation rate of 95% for one year olds or for the four in one pre-school vaccine. In addition the 95% target uptake for the first or second dose of the Measles, Mumps & Rubella (MMR) immunisation is not being achieved.

Consequently, some children in North Wales are starting school without receiving the recommended two doses of MMR immunisation. This leaves communities at risk of outbreaks.

#### 3.2.1 What we are doing locally to improve uptake of childhood vaccinations?

A new action plan has been developed to improve immunisation for all ages. This plan covers training; improving the provision of information and support; targeted interventions where uptake is lower; and improvements in the way that immunisation records are kept so that children can be more accurately targeted.
3.2

Protecting the health of women and the unborn child through immunisation
3.2 Protecting the health of women and the unborn child through immunisation

3.2.1 MMR vaccination

Immunisations given during a child’s life provide protection into adulthood and in particular, benefit pregnant women. By ensuring that all children leave school having received two doses of MMR, the numbers of cases of rubella infections in the community are reduced. If a pregnant woman contracts rubella it can cause devastating abnormalities to the unborn baby. If she has received two doses during childhood she is reliably protected against this infection. Health services need to have robust systems in place to ensure women found not to be immune to rubella during their first pregnancy are offered MMR vaccination to ensure immunity for subsequent pregnancies.

3.2.2 Human Papilloma Virus (HPV) vaccination

Girls aged 12-13 years are offered a course of HPV vaccine to reduce the chances of developing cervical abnormalities and cancer caused by the virus by around 70%. In addition to the life saving potential of the vaccine, protecting girls against cervical abnormalities caused by HPV also increases the chance of a normal delivery if they become pregnant.

North Wales has an average uptake of 85% and is not currently achieving the 90% target (Public Health 2011b).

3.2.3 Influenza

Pregnant women have recently been identified as a group at risk of developing complications from seasonal flu infection. If a pregnant woman were to develop complications the health of the unborn baby can also be affected (Public Health Wales 2011c).

A seasonal influenza vaccination programme is now offered on an annual basis to all pregnant women to help prevent them catching influenza and therefore avoid the risk of complications. Influenza uptake in pregnant women (with no other risk conditions) in North Wales in 2010/11 was 43.1% compared to 39.6% across Wales (Public Health Wales 2011c). Health services need to have robust systems in place to ensure a high uptake of the flu vaccination among pregnant women.
3.3 Childhood Obesity – why it is important

People become overweight when their consumption of food exceeds the number of calories used. There are a number of risk factors for unhealthy weight in children including a sedentary lifestyle, poor diet, social deprivation and parental obesity.

In children and teenagers a wide range of health problems can be associated with excess weight including high blood pressure, diabetes, psychosocial dysfunction and the worsening of existing conditions such as asthma. However in children, the persistence of obesity into adulthood is the most important concern. This risk increases with age and according to the severity of obesity.

The prevalence of obesity in the UK has more than doubled in the last 25 years, making obesity a major public health issue. It has been estimated that by 2050 60% men, 50% of women and 25% of the children in the UK will be obese (Foresight 2007).

It is important to recognise that adults have an important role in determining the lifestyle choices of children, particularly during the earliest years of a child’s development.

Factors such as income, gender and a person’s ethnicity increases the impact of obesity within certain population groups (Foresight 2007).

A study measuring the prevalence of overweight and obesity in Wales found that 22% of school children in the Reception Class measured as being overweight or obese (Public Health Wales 2010c).

Recent guidelines issued by the four Chief Medical Officers in the UK draw on global evidence for the health benefits people can achieve by taking regular physical activity (Department of Health 2011). The report emphasises the importance of physical activity for all ages. The guidelines for under five year olds are:

- Physical activity should be encouraged from birth, particularly through floor-based play and water-based activities in safe environments.
- Children of pre-school age who are capable of walking unaided should be physically active daily for at least three hours, spread through the day.
- All under five year olds should minimise the amount of time spent being sedentary (being restrained or sitting) for extended periods (except time spent sleeping).
Case study:
The Anglesey Healthy Preschool Scheme

Following the success of the Anglesey Healthy Schools Scheme and the award of the first National Quality Assurance Award in North Wales to Ysgol Uwchradd Bodedern, the Anglesey Education Department in partnership with Public Health Wales worked together to establish a local healthy pre-school scheme.

The scheme includes all 57 cylchoedd meithrin and playgroups on the island. All children within the pre-school settings were given opportunities to:

- use the outdoor environment regularly by going for walks and enjoying movement sessions;
- grow vegetables and prepare healthy foods;
- taste new foods;
- learn about where food comes from and what makes a healthy diet;
- learn about the importance of hand washing before eating snacks;
- learn how to brush their teeth.

Each preschool setting developed a healthy snacks policy, and the leaders were supported by a retired teacher who visited each group.

Each group provided an evidence portfolio which was assessed at the end of the year. All of the pre-school groups successfully reached their objectives and were awarded their certificates at the annual Healthy Schools Award ceremony.

The preschools are currently working on the second phase of the scheme and are addressing objectives that relate to safety and the environment.
3.4

Oral Health in North Wales - why it is a problem
3.4 Oral Health in North Wales
- why it is a problem

Despite the fact that it is largely preventable, dental caries (tooth decay) is the main oral disease in early childhood. Dental decay in young children is strongly linked to deprivation and frequently leads to pain and infection necessitating hospitalisation for dental extractions under general anaesthesia. As well as the discomfort of pain and infection, young children can experience loss of sleep, absence from school and low self esteem.

More than half (53%) of children in Wales have experienced dental caries by the age of five (Welsh Oral Health Information Unit 2005/06).

Although the North Wales figure, at 46%, compares favourably with the Welsh average, there is variation when looking at the data for smaller geographical areas. For example, in one county in North Wales, five-year-old children with decay in one ward is 31% compared to 67% in another ward with higher levels of socio-economic deprivation (Welsh Oral Health Information Unit 2005/06).

Treatment index records record the proportion of teeth that have been treated with fillings or have been extracted because of decay. In North Wales these records indicate that a very high proportion of disease may be going untreated.

3.4.1 What is being done to tackle tooth decay?

Case study:
Designed to Smile

Designed to Smile is a three year national pilot oral health programme commenced in January 2009 and funded by the Welsh Government. It started in North and South Wales but due to its success has been rolled out across Wales and includes 0 to 3 year olds in targeted areas.

Fluoride applications have been introduced as part of the initiative. At the end of March 2011, some 159 schools were participating in the scheme and 13,334 children were brushing at school on a daily basis. Additionally, 107 preschool venues were engaged with 2,667 children aged three and under, participating in the pre-school aspect of the programme.
3.4.2 What do we know works to prevent dental decay

The two key messages to prevent tooth decay/dental decay are:

- regular tooth brushing as soon as the first tooth appears;
- limit the amount of sugar that the teeth come into contact with.

Parents and families should refer to health professionals for advice on tooth brushing and diet and health professionals should ensure they are up to date with the latest evidence on weaning and diet.
3.5 Exposure to second hand tobacco smoke in childhood - why it is a problem

The predominant source of second hand smoke exposure for children is smoking in the home by their parents. Children who live in households where someone smokes on most days are exposed to about seven times more smoke than children who live in smoke free homes and it is estimated that exposure to smoke in the household causes around 40 sudden infant deaths in the UK each year.

In North Wales, 24% of the adult population smoke and exposure to tobacco smoke is still greatest among children from lower socio-economic status households (Welsh Assembly Government 2010a).

The Royal College of Physicians report on Passive Smoking and Children identified that children regularly exposed to second hand smoke have (Royal College of Physicians 2010):

- more than double the risk of sudden infant death;
- increased risk of lung infections and wheezing at all ages;
- increased risk of lower respiratory tract infection in children under the age of 3 years;
- increased risk of asthma and middle ear disease in young children;
- more than double the risk of bacterial meningitis.

The Royal College of Physicians have calculated the costs to the NHS of consultations attributable to second hand smoke see Table 5.

Table 5: Cost at 2007 prices of primary care consultations for diseases in children caused by passive smoking in the home

<table>
<thead>
<tr>
<th>Disease</th>
<th>Age (Years)</th>
<th>UK consultations attributable to smoking</th>
<th>Cost of consultations (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower respiratory infection</td>
<td>≤ 2</td>
<td>26,000</td>
<td>780,000</td>
</tr>
<tr>
<td>Middle ear infections</td>
<td>0-16</td>
<td>160,000</td>
<td>4,806,000</td>
</tr>
<tr>
<td>Wheeze</td>
<td>≤ 2</td>
<td>10,300</td>
<td>309,000</td>
</tr>
<tr>
<td>Asthma</td>
<td>3-4</td>
<td>7,600</td>
<td>228,000</td>
</tr>
<tr>
<td>Asthma</td>
<td>5-16</td>
<td>99,000</td>
<td>2,970,000</td>
</tr>
<tr>
<td>Meningitis</td>
<td>0-16</td>
<td>800</td>
<td>24,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>303,900</td>
<td>9,117,000</td>
</tr>
</tbody>
</table>

Source: Royal College of Physicians, 2010

The potential wider financial and economical impacts of passive smoking in children are difficult to measure fully. Children’s ill health may impact on their schooling and their educational achievements. Such impacts are then likely to impact on their future earning capacity and their long term health and well being.
3.5.1 What works to stop children being exposed to second hand smoke?

- Reduce the numbers of parents and future parents who smoke.
- Make **homes completely smoke free** to prevent exposure to second hand smoke in the home environment.
- Health professionals in primary and acute care settings should take the opportunity to advise all patients who smoke to quit when they attend a consultation, this is described as a **brief intervention** (National Institute for Clinical Excellence 2006). Those who want to stop should be offered a referral to an intensive support service such as Stop Smoking Wales.

The Welsh Government is currently debating the issue of smoking in cars with children and has announced that it will consider legislation if people’s attitudes do not change in three years. It is important that all professionals working with families take every opportunity to give strong consistent messages on the dangers of smoking in cars with children and lobby to support such a ban in order to protect children’s health.
3.6

Preventing childhood injuries – why it is important
Injuries are a key cause of death and disability among children and place significant burden on individuals, families, health services and wider society. Inequalities in childhood injuries are stark as children from the poorest families are at least three times more likely to die from an accident than those who are from the wealthiest families (Children in Wales 2009). Injuries are not inevitable; they can be prevented or controlled by effective interventions.

The National Institute for Health and Clinical Excellence (NICE) favour the term unintentional injuries, as the word accident implies an unpredictable and therefore unavoidable event (National Institute for Health and Clinical Excellence 2010b). The World Health Organisation states that (World Health Organisation 2008):

As injury is a leading cause of death and disability among children worldwide, preventing child injury is closely connected to other issues related to children’s health. Tackling child injury must be a central part of all initiatives to improve the situation of child mortality and morbidity and the general well-being of children.

3.6.1 What do we know?

There were 833 admissions to hospitals due to injuries among children aged five years and under in North Wales during 2009.

Table 6: Emergency hospital admissions for injuries, children aged 0 to 5 years, North Wales, 2009

<table>
<thead>
<tr>
<th>Area</th>
<th>Number of admissions</th>
<th>Crude rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Wales</td>
<td>833</td>
<td>1,856</td>
</tr>
<tr>
<td>Isle of Anglesey</td>
<td>116</td>
<td>2,573</td>
</tr>
<tr>
<td>Gwynedd</td>
<td>166</td>
<td>2,220</td>
</tr>
<tr>
<td>Conwy</td>
<td>134</td>
<td>1,975</td>
</tr>
<tr>
<td>Denbighshire</td>
<td>128</td>
<td>2,094</td>
</tr>
<tr>
<td>Flintshire</td>
<td>178</td>
<td>1,720</td>
</tr>
<tr>
<td>Wrexham</td>
<td>111</td>
<td>1,151</td>
</tr>
</tbody>
</table>

Produced by Public Health Wales Observatory, using PEDW (NWIS)

The most common type of injury resulting in accident and emergency attendances for the five years and under age group include poisoning/overdose, lacerations/wounds and scalds. Data relating to the location of injuries shows that the 0 to 5 year age group are at the highest risk of injury in the home (National Institute for Health and Clinical Excellence 2010b).
The National Institute for Health and Clinical Excellence (NICE) in their recommendations for reducing unintentional injuries among under 15s recommend (National Institute for Health and Clinical Excellence 2010b):

- That priority should be given to identifying those households where children and young people aged under 15 years are at greatest risk of unintentional injury. Households should be identified based on surveys, needs assessments and existing datasets (such as local council housing records).

- That the households identified should be prioritised for home safety assessments. ‘Priority households’ could include those with children under five; families living in rented or overcrowded conditions; families on a low income; and those living in a property where there is a lack of appropriately installed safety equipment.

3.6.2 What do we know works?

Children in Wales (Children in Wales 2009) have identified the most effective injury prevention programmes, which require partnership working and collaboration between agencies.

In the home:
- Home based social support, such as a health visitor visiting a young family regularly, significantly reduces the rate of childhood injury.
- There is evidence to suggest that home equipment schemes which include the identification of families in need, followed by the provision of identified home safety equipment including stair gates, fire guards and thermostatic mixing valves, window restrictors and cupboard and window restrictors would help reduce injury.
- Child resistant containers on medicines and dangerous substances have substantially reduced mortality.
- Window bars reduce childhood injury and death from falls.
- Education initiatives targeted at the most vulnerable families when combined with practical help, such as free or subsidised stair gates, reduce child injury.
- Promoting parental education through schemes such as Sure Start are likely to reduce injuries due to the positive impact on behaviour.
- General safety devices such as coiled kettle flexes, safety catches for cupboards and smoke detectors are shown to reduce injury.

On the road:
- Using seatbelts and child safety restraints results in fewer injuries.
- Enforcing speed limits results in fewer injuries.
- Design changes to roads reduce deaths and area traffic management schemes reduce the number of pedestrian injuries.
- Children who wear cycle helmets experience fewer injuries.

Injury prevention is the responsibility of several organisations, as the range of actions required is broader than the remit of one individual organisation. Across North Wales the Children & Young People’s Partnerships have taken a leading role with developing local partnerships to coordinate the prevention of effective injury prevention programmes and there is further opportunity to strengthen the partnership working in accordance with the Working Towards a Child Safety Strategy for Wales (Children in Wales 2009) and the National Institute for Health and Clinical Excellence Guidance to support the development of local strategies to prevent unintentional injuries among children and young people aged under 15 (National Institute for Health and Clinical Excellence 2010b).
Chapter 4
Preparing for Parenthood
Preparing for Parenthood

Key Messages and Recommendations

• Positive parenting has a profound effect on the personal, emotional, mental, social, intellectual and physical development of the child.
• Strong and affectionate relationships between parents and children, fostered in the first three years of life, coupled with positive consistent parenting, makes a real difference to social, health and educational outcomes for children.
• Mental ill health impacts on the ability to provide positive parenting and this is particularly important in the first two years of life when attachments are forming and brain development is most rapid.
• NHS and partners should ensure robust mechanisms exist to identify parental mental health issues as early as possible and to facilitate referral to the most appropriate service in a timely manner.
• High quality evidence exists to support the availability of group based parent-training programmes designed to promote emotional attachment and improve parenting skills – NHS and partners should ensure equitable access to evidence based parenting support is available across North Wales.
• Transformational change is required in the way public sector services work together to support vulnerable families. A much stronger focus on prevention, early intervention and universal services is required in order to reduce health inequities, improve outcomes and protect children.
• NHS and partners need to actively engage in targeted partnership approaches such as Families First, Flying Start and Integrated Family Support Service in order to address inequalities through facilitating access to prevention and early intervention services and good quality parenting support.
4.1 Preparing for parenthood - why it is important

Positive parenting has a profound effect on the personal, emotional, mental, social, intellectual and physical development of the child. Within this chapter the factors contributing to the development of parenting skills, and the ways that parents can be supported to parent more effectively will be described. This has to be a partnership approach and cannot be the work of one single agency or setting, this is evident in the examples of partnership working cited in this report.

4.1.2 Opportunities for preparing for parenthood

Parenthood education is vital to help children and young people think about the role of parenting before they actually become parents themselves. They can learn the skills that are necessary for successful family relationships, gain knowledge about child development and develop their understanding of some of the reasons for good and bad parenting.

Since 2008 there has been a Welsh Government requirement for the provision of a Personal and Social Education Framework for 7 to 19 year olds. Within this framework pupils in Key Stage Three (the first three years of secondary school) are required to explore:

- the features of safe and potentially abusive relationships;
- the role of marriage, the importance of stable family relationships and the responsibilities of parents;
- the features of effective parenthood and the effect of loss and change in relationships; and
- the factors that affect mental health and the ways in which emotional well being can be fostered.

Positive parenting skills can help young people grow up with a clear understanding of the parenting role. Parenting education within schools increases the likelihood of young people becoming more effective parents in the future.
4.1.3 Positive Parenting

Babies born to parents who understand and meet their physical and emotional needs have a good chance of reaching their full potential later in life. Positive parenting practices have a profound impact on children’s development, and especially on child mental health and well-being.

Parenting style strongly affects how children feel and behave. Strong and affectionate relationships between parents and children, fostered in the first three years of life, coupled with positive consistent parenting, makes a real difference to social, health and educational outcomes for children.

When parents are bringing up their children in difficult circumstances, it is even more important that help and support is easily accessible and effectively delivered to enhance positive parenting.

4.1.4 Parenting programmes – what works?

There is a strong body of evidence to demonstrate that well-designed pre-school programmes aiming to improve parenting skills show a high level of effectiveness, including cost-effectiveness.

Significant improvements in children’s behaviour and parental mental health (specifically low mood) can be achieved if evidence-based parenting courses are delivered effectively. These benefits persist throughout childhood and into adult life, leading to such outcomes as improved employability and earnings, and reduced criminal behaviour.

Programmes such as the Incredible Years series and Triple P, both of which focus on strengthening parenting competences have an impressive evidence base and are being delivered in many parts of North Wales.
4.1.5 What needs to be done to support positive parenting?

• Increase and ensure equitable access to good quality, evidence based parenting programmes for parents of infants and toddlers in North Wales.
• Develop and enhance strong local multi-agency partnership approaches to planning and delivering parenting interventions if sustainable outcomes are to be achieved.
• Appropriate training, support and supervision for the staff delivering programmes.
• Reliable, valid and consistent outcome measures need to be agreed in order to evaluate effectiveness over time and compare effectiveness across programmes.
• Programmes need to be targeted at specific groups of parents who most need help, and delivered flexibly in a non-stigmatising environment.

Case study:
The Sure Start Arts Project Llandudno – Summer 2010

The project took place in the Llandudno Area with two distinct groups of parents, one from a rural area and one from a Communities First area, the sessions promoted parents and children working together. The project aimed to:
• develop appropriate group behaviour;
• build confidence and self esteem and raise aspirations; and
• build on developing recognisable skills that could lead to future learning and employment.

Outcomes:
• 28 parents and children took part.
• All parents produced several pieces of finished art work.
• Parents reported gaining confidence.
• 10 young parents attended and completed the condensed version of the Family Links Nurturing Programme.
• The completed art work was put on public display.

Qualitative Feedback
‘I never thought I would be able to do this, I still can’t believe I did. I’m going to hang it in their bedroom. I want my children to see what I can do.’
‘I created a cushion and I’ve never made anything before.’
‘I think the project has been excellent, I have bonded with the staff.’
‘I didn’t want it to end, we used to go to the park after the group finished to sew.’
‘You were dead right about Kids giving me some time to stitch! And make! We did it as a family and I managed to make something.’
4.2 Mental well being - why it is important

An unhappy, unresponsive adult carer limits a baby’s ability to develop its social and emotional capabilities (Allen 2011)

Mental well-being includes either the absence, or good management, of mental ill-health, as well as positive factors contributing to a holistic sense of wellness and being happy. Mental ill health impacts on the ability to provide positive parenting and this is particularly important in the first two years of life when attachments are forming and brain development is most rapid (Allen 2011). Good parental mental health is an essential component of secure attachment. This has an important role to play in children’s physical health; brain development; self esteem; social skills; and emotional competence.

A range of factors can make mental wellbeing particularly difficult for pregnant women and new mothers and fathers including:

- the stresses of pregnancy and parenthood, including postnatal depression (experienced by more than one in ten mothers);
- poverty and disadvantage;
- domestic violence or bullying;
- poor housing and an unsafe physical environment;
- use of drugs and alcohol;
- social isolation, including looked-after young people, migrants, refugees and asylum seekers;
- mental or physical ill-health or disability.
4.2.1 What helps to improve parental mental well being? (National Institute for Clinical Excellence 2007b)

- High quality evidence exists to support the availability of group based parent-training programmes designed to promote emotional attachment and improve parenting skills. Providing consistent support to parents (including fathers) during pregnancy and through the early years is important in achieving this.
- Ante-natal checks to identify risk factors, including routine enquiries about domestic abuse and drug/alcohol use.
- Additional care and support is provided for vulnerable mothers and also for fathers.
- Robust mechanisms in place to identify mental health issues as early as possible and to facilitate referral to the most appropriate service in a timely manner.
- Postnatal care contacts should include routine enquiries about emotional wellbeing and coping strategies.
- Specialist support should be provided for ongoing and severe problems. Treating psychological distress in parents is also beneficial to their children who have not yet been affected (primary prevention), and those children who have already been exposed to its effects (secondary prevention).
- A good home learning environment for pre-school and primary school children to aid development of social and emotional competence in the early years.

Case study:
Early Intervention and Prevention Case Study Flintshire

Flintshire's Early Intervention and Prevention Team and Flintshire's Child and Adolescent Team were recognised for excellent practice in the field of mental health when they became the winner of the second annual Royal College of Psychiatry Awards in 2010. The multi-disciplinary and multi-agency teams won the Specialist Child and Adolescent Mental Health Services Provider of the Year, in recognition of their "outstanding contribution to mental health".

The Flintshire Early Intervention and Prevention Team delivers the Primary Mental Health component of Child and Adolescent Mental Health Services (CAMHS), helping parents and colleagues who have questions or concerns about emotional and behavioural difficulties, or the things that can give rise to these difficulties, in children and young people of all ages and their families. The team aims to catch things at an early stage by offering brief interventions as quickly as possible, and also by building understanding and skills in staff groups who are in frequent contact with children and young people in their everyday work. Where there are concerns about parent well-being, counselling is available for parents whose needs cannot be met by adult services, as even mild to moderate emotional difficulties in adults can have a significant impact on parenting.

Our focus is on quick assessment, brief goal-focused direct interventions, supported signposting, and work with professionals to help them to address mental health problems earlier and where appropriate within their existing roles.
4.3 Safeguarding children – why it is important

Children enjoy the best possible health and are free from abuse, victimisation and exploitation (WAG 7 Core aims for children)

At the end of March 2010 there were 2,730 children and young people on Child Protection Registers across Wales, 440 in North Wales. There were 17,159 children classed as ‘in Need’ across Wales with 2,876 (16%) of these children living in North Wales. (Welsh Assembly Government 2010b). Children in need are not necessarily deemed to be ‘at risk’ and only children in need of protection are added to the child protection register. In accordance with the Children Act 1989, a child shall be taken to be in need if:

- He/She is unlikely to achieve or maintain, or to have the opportunity of achieving or maintaining, a reasonable standard of health or development without the provision for him/her of services by a local authority.
- His/Her health or development is likely to be significantly impaired, or further impaired, without the provision for him/her of such services.
- He/She is disabled.

The statistics demonstrate the fact that a proportion of children in North Wales will be suffering abuse from their parents and carers under one (or more) of the four following categories: physical, emotional, sexual and neglect. This will have potential long term consequences on the health and well being of children into adulthood. Health Boards are required to work with partners to safeguard and promote the welfare of children.

There are a number of targeted services aimed at particularly vulnerable families including Flying Start, Families First and the Integrated Family Support Service which provides intensive support to parents identified as having issues with alcohol and substance misuse. These are multi-agency initiatives and support families to make a positive change to their lives.
4.3.1 Domestic Abuse


the use of physical and/or emotional abuse or violence, including undermining of self confidence, sexual violence or the threat of violence, by any person, who is or has been in a close relationship with the victim, including abuse of parents or adult children.

The growth in public and professional understanding and acknowledgement of domestic abuse has been one of the most significant developments of the last 30 years. It is now far more widely recognised that domestic abuse affects people from all walks of life and from all cultural, social and ethnic backgrounds. Domestic abuse can include all kinds of physical, sexual, emotional and financial abuse. Domestic abuse is gendered – the majority of perpetrators are men and between 80-95% of those who experience it are women. However, it can occur within all kinds of intimate relationships including same sex relationships, with one in four victims being in a same sex relationship.

Domestic abuse includes actual harm of children as part of controlling women and is a strong indicator of child abuse. The Children’s Act has extended the definition of ‘harm’ to include any impairment to a child’s health and development as a result of witnessing the ill treatment of others.

Domestic abuse and the crimes associated with it cannot be resolved by the Police and Criminal Justice System alone, and the All Wales Violence Against Women and Domestic Abuse Implementation Plan (Welsh Assembly Government 2010c) sets out how joint collaboration and action can bring down barriers, share information and work collectively to meet the needs of victims under the guidance of the Multi Agency Risk Assessment Conference (MARAC).

4.3.2 What do we know works?

- Maintaining an effective, skilled and well resourced front line workforce who work directly with children and their families is key to protecting and promoting the welfare of those affected by domestic abuse. This includes in particular the maternity, health visiting and school nursing services, Emergency Departments and adult mental health services.
- Ensuring staff are trained to recognise and suspect abuse and know what to do.
- Organisations require safe recruitment with robust vetting procedures including CRB checks in place to help prevent unsuitable people from working with children directly or indirectly.
- Effective information sharing by professionals is central to safeguarding and promoting the welfare of children. Health staff will need organisational guidance and support to know when and how to share information appropriately.
4.3.3 Supporting Vulnerable Families

Some children and families are particularly vulnerable to poor health outcomes arising from their life circumstances. Vulnerability is sometimes defined as families having five or more of the following disadvantages (although any one alone may be severe enough to create vulnerability):

- No parent in work;
- Poor/overcrowded housing;
- No parental qualifications;
- Mother has mental health problems;
- Parental longstanding limiting illness/disability/infirmity;
- Family has low income (below 60% median);
- Family cannot afford certain food/clothing items;
- Domestic violence within family;
- Substance misuse within family.

Some families may be immediately vulnerable due to being refugees or asylum seekers, or by suffering discrimination, or other serious circumstances. Such vulnerability endangers the physical and/or mental well-being of all family members, especially the youngest. In addition the problems can make it harder for families to have access to available services and to have sustained and successful contact with them, thus prolonging the problems and increasing the likelihood of issues continuing to affect the next and subsequent generations. The focus needs to shift more to prevention and early intervention especially in the early years. High quality parenting support is particularly important as it is known that strong, positive parenting can protect children against some of the negative impacts of poverty and disadvantage (Department of Health 2009).

In order to best support these families it is important to address the wider determinants of their economic circumstances and promote job availability through economic development. This would be helped by closer working between services, making it simpler for families and services to keep in touch, and avoiding premature withdrawal of services that are making a difference.

The ‘Torri’r Cylch – Breaking the Cycle’ project undertaken recently in Gwynedd focused on 50 of the most vulnerable families in the county. The aim of this project was to look in detail at the public sector support to vulnerable families. The case for change document (Torri’r Cylch Project Board 2011) produced as part of this project found that there is a lack of integration of services supporting these families, a need for a more family focused approach, a cyclical pattern to the experience of some of the most vulnerable families and a reactive rather than proactive approach with a lack of prevention and early intervention – highlighting in many areas these interventions were often at risk due to the economic situation.
The report concluded that in order to improve outcomes a transformational change is required in the way public sector services work together to support these families, with a much stronger focus on prevention, early intervention and universal services. The report highlights a strong economic case for making these changes; the ‘do nothing’ option is not an option. There is a trend towards an increase in demand for services and an increasing cost of service delivery.

The findings of the Torri’r Cylch work will now be taken forward by the North West Families First Consortium. The Families First project is a Welsh Government funded initiative that operates across North Wales in two consortia. Families First and Integrated Families Support Service (IFSS) are both based on the principles of Team around the Family approaches. This model should reduce duplication; strengthen communication between agencies and result in multi-agency proactive care planning for children and their families with potentially a single point of access.

The Welsh Government describes this model as an arch, Families First focussing on Prevention and Protection and IFSS focussing on Remedy with some overlap to Protection.

Families First's focus on ‘Prevention’ and ‘Protection’, responds to the needs of families before they escalate into crisis or child protection.

The Welsh Government has set the challenge of eradicating poverty by 2020. Families First will strive towards this goal by aiming to reduce the number of families living in workless households by:

- Improving the skills of parents and young people living in low income households so they can secure well-paid employment;
- Reducing the inequalities that exist in health, education and economic outcomes of children and families by improving the outcomes of the poorest.

These projects provide a vital opportunity to address many of the issues that have been highlighted in this report. In particular, with other targeted and funded projects such as Flying Start, they offer the opportunity to strengthen the support to vulnerable families and those living in our most deprived communities to address the wider determinants of health; take a preventative approach; work in partnership; and ensure the next generation of children have the opportunity to break out of the cycle of poverty, disadvantage and poor health.
5. Glossary

**Immunisation/vaccination:** These words can be used interchangeably when discussing vaccine preventable diseases. They both represent the process of giving vaccines to develop antibodies to protect against certain infections.

**Vaccine preventable disease:** a disease which can be prevented by the giving of a vaccine which induces immunity. When a vaccinated person comes into contact with the infection the person is protected as antibodies have developed in the person to fight off the infection. Most vaccine preventable diseases can in rare cases result in death following complications.

**Diphtheria:** is a contagious bacterial infection that mainly affects the nose and throat. Less commonly, it can also affect the skin.

**Tetanus:** is a serious, acute (severe but short lived) condition that is caused by infection with a bacterium known as Clostridium tetani which is found in soil, it can never be eradicated.

**Poliomyelitis:** also known as polio is caused by a highly infectious virus. For most people, polio is a mild illness and causes flu-like symptoms. However, polio can be potentially fatal. A severe case of polio attacks the nerve cells that help the muscles to function and can cause severe muscle paralysis (paralytic polio).

**Hib (Haemophilus influenzae type b):** is a bacterial infection that can cause a number of serious illnesses such as pneumonia, blood poisoning and meningitis, especially in young children.

Pertussis: sometimes known as whooping cough is a highly infectious disease causing an infection of the lining of the airways. It mainly affects the windpipe (trachea) and the two airways that branch off from it to the lungs (the bronchi).

**Pneumococcal infection:** is caused by the S. pneumoniae bacterium entering the nose and mouth causing various serious infections such as meningitis or otitis media.

**Meningitis C:** Meningitis is an infection of the meninges (the protective membranes that surround the brain and spinal cord). The infection can be caused by bacteria, and it leads to the meninges becoming inflamed (swollen). This can damage the nerves and brain.

**MMR:** Measles mumps rubella vaccine.
Measles: is a highly infectious viral illness. It causes a range of symptoms including fever, coughing and distinctive red-brown spots on the skin. However, possible complications of measles include pneumonia, ear and eye infections and croup (an infection of the lungs and throat). More serious complications, such as inflammation of the brain (encephalitis), are rarer but can be fatal. There are hundreds of thousands of deaths worldwide from measles every year.

Mumps: is a highly contagious viral infection that usually affects children but can affect adults as well. The most common symptom of mumps is a swelling of the parotid glands. The parotid glands are located on one side, or both sides, of the face. The swelling gives a person a distinctive ‘hamster face’ appearance. Serious complications can occur such as hearing loss and meningitis.

Rubella: (German measles) is an infectious disease that is caused by a virus. It can cause a distinctive red-pink rash. In most cases, rubella is a mild condition, but it can be serious in pregnant women as it can harm the unborn baby causing brain damage, eye abnormalities, heart problems and deafness. The rubella virus is passed on through droplets in the air from the coughs and sneezes of infected people. It is about as infectious as flu. Anyone can get rubella, but young children are most commonly affected.

Human Papilloma Virus: The human Papilloma virus (HPV) is the name given to a family of viruses that affect the skin and the moist membranes (mucosa) that line the body. There are over 100 different types of HPV, with around 40 types affecting the genital area. These are classed as high-risk and low-risk depending on the type of conditions that they can cause.

Influenza: also known as Seasonal flu is a highly infectious illness caused by a flu virus. The virus infects your lungs and upper airways, causing a sudden high temperature and general aches and pains. However, elderly people or those with certain medical conditions may develop a complication as a chest infection. This can lead to serious illness and can be life-threatening.

MSOA - Middle Super Output Area: Defined geographical area based on Census output areas with an average of 7500 persons per MSOA. There are 413 MSOAs in Wales, and the number of MSOAs can vary between health boards.
6. References


Welsh Assembly Government 2001. Investing in a better start: Promoting breast feeding in Wales. Available at: http://wales.gov.uk/topics/health/improvement/pregnancy/breastfeeding/index/investing/?sessionid=qJTSMK5GwXqqv3h0zMm22L8H8Jb0LvQ5WQGMCMJTTxhM3YXxJM!-25131489?lang=en [accessed 20.06.11]


Appendix 1: Programme for International Student Assessment (PISA) Scores
Source: Bradshaw et al 2010

PISA 2009: Reading
Appendix 2: Routine childhood immunisation schedule

<table>
<thead>
<tr>
<th>When to immunise</th>
<th>Diseases protected against</th>
</tr>
</thead>
</table>
| Two months old                        | Diphtheria, tetanus, pertussis, polio and Haemophilus influenzae type b (Hib)  
                                         | Pneumococcal infection                                           |
| Three months old                      | Diphtheria, tetanus, pertussis, polio and Haemophilus influenzae type b (Hib)  
                                         | Meningitis C                                                     |
| Four months old                       | Diphtheria, tetanus, pertussis, polio and Haemophilus influenzae type b (Hib)  
                                         | Meningitis C                                                     |
|                                        | Pneumococcal infection                                           |
| Around 12 months old,                 | Hib/MenC, Measles, mumps and rubella (MMR),                     |
| after the first birthday              | Pneumococcal infection                                           |
| Three years four months to five years | Diphtheria, tetanus, pertussis and polio                         |
|                                      | Measles, mumps and rubella (MMR)                                 |
| Girls aged 12 to 13 years             | Cervical cancer caused by human papillomavirus (HPV) types 16 and 18 |
| Thirteen to 18 years old              | Tetanus, diphtheria and polio                                   |
Appendix 3: Deprivation

In North Wales, Denbighshire has the highest percentage of lower super output areas in the most deprived fifth in Wales, and contains three out of the top five most deprived areas in Wales. Wrexham contains the second highest percentage of LSOAs in the most deprived fifth in Wales; Gwynedd has the lowest percentage of LSOAs in the most deprived fifth in Wales.