Life Course epidemiology and health inequalities:

How life course approach is translated into practice?

Bruce Whyte

August 2011

Overview

- What can a life course approach tell us
- Different approaches
- Scottish examples
- Some examples from work at GCPH -
  - Breastfeeding, active travel, food in schools, young people's attitudes to alcohol, adult mental health
- Major research programmes:
  - Psobid
  - Go Well

Life course evidence

- The life course perspective is concerned with the potential long-term impacts on health of various events, transitions and exposures in life
- Early work has focused on events and exposures in fetal life
- Chronic diseases – coronary heart disease, stroke and cancer – are influenced by factors across the life course e.g. smoking, *helicobacter pylori* infection during childhood causing gastric cancer
- Large birth cohorts being established to study health across the life course and across future generations.
- The aim of these studies is to better understand the relationship between social, behavioural, biological and genetic factors throughout an individual's life and assess their association with later disease

Osler M. ***The life course perspective: a challenge for public health research and prevention.*** *Eur J Public Health. 2006 Jun;16(3):230.*

Data and methodology to support life course approaches

- Studying complex interrelationships of biologic and social variables over time requires longitudinal information spanning broad periods of life.
- It also raises analytical problems because temporal, and possibly causal, hierarchies among the exposures need to be taken into account.

De Stavola BL, Nitsch D, et al. Statistical issues in life course epidemiology. Am J Epidemiol 2006;163:84–96.

Potential data sources and issues

- **Longitudinal birth cohort study** – costly to set up and follow-up
- **Repeat cross-sectional survey -** cheaper, population level changes, but cannot track individuals through time
- **Linked administrative data** – potentially costly, range of variables, data quality, linkage expertise
- **Mix of linked administrative and survey data** – requires agreement to follow-up and link, linkage expertise

Growing Up in Scotland

- GUS is a large scale longitudinal and cross sectional study. It will provide information about how circumstances and experiences for children in Scotland are changing and will also provide data about 'outcomes' for children and the factors that influence outcomes.

- The focus of interest in the study lies in the characteristics, circumstances and experiences of Scotland's children in their early years and subsequently through to adolescence. The main areas to be monitored and evaluated will be:
  childcare, education, social work/ support for parents, health and social inclusion

How many are taking part?

8,000 children were enrolled into the study in 2005-06
5,000 were babies (~10 months) born between June 2004 and May 2005
3,000 were toddlers (~34 months) born between June 2002 and May 2003.

A further 6,000 children born between March 2010 and February 2011 will be enrolled during 2010-11. Families will be visited when their baby is 10 months old.

http://www.crfr.ac.uk/gus/index.html

West of Scotland Twenty-07 study

- **The Twenty-07 Study was set up in 1986 in order to investigate the reasons for differences in health by socio-economic circumstances, gender, area of residence, age, ethnic group, and family type.**

- **4510 people are being followed for 20 years. The initial wave of data collection took place in 1987/8, when respondents were aged 15, 35 and 55. The final wave of data collection took place in 2007/08 when respondents were aged 35, 55 and 75.**

- **The study provides opportunities to investigate both the changes in people's lives over 20 years and how they affect their health, and the differences in people's experiences at the same ages 20 years apart, and how these have different effects on their health.**

http://2007study.sphsu.mrc.ac.uk/

The Scottish Longitudinal Study

- **The Scottish Longitudinal Study (SLS) is a large-scale linkage study which has been created by using data available from current Scottish administrative and statistical sources. These include Census data, Vital Events data (births, deaths, marriages), National Health Service Central Register (NHSCR) data (migration in or out of Scotland) and NHS data (cancer registrations and hospital admissions).**

- **SLS sample members are those who have one of the 20 birthdays included in this study. For this group, data from the 1991 and 2001 Census are linked together. Information is collected about those living in the same household at the time of the census, but the data from subsequent censuses are not linked together for these people. Also, the vital events and health data are only linked to the SLS sample members**

- **http://www.lscs.ac.uk/sls/**

ISD linked datasets

- **SMR linked dataset (SMR01, 04, 06 and GROS deaths records)** Hospital discharge records, submitted between 1980 to present day from non-obstetric specialties combined with cancer and death registration records to form continuous patient level profiles.

- **Maternity and Neonatal Linked dataset (SMR02, SMR11, Scottish Birth Record, Stillbirth and NeoNatal Deaths records)** The maternity and neonatal database brings together the obstetric histories of mothers delivering in Scotland over the past 25 years and links this with morbidity and mortality outcomes relating to offspring.

- ISD regularly produce linkages that include two other data sets, the Scottish Health Survey and the Scottish Longitudinal Study.

- **http://www.isdscotland.org/Products-and-Services/Medical-Record-Linkage/Linked-Data/**

The Scottish Health Survey & hospitalisation linked dataset

- **The Scottish Health Surveys (1995, 1998, 2003 and 2008) provide reliable information on the health and health-related behaviours of people living in private households.**

- **The surveys include an extensive range of health-related factors (e.g. long-standing illnesses, recent diagnoses, prescribed medicines), along with behavioural variables (e.g. smoking, drinking, diet, physical activity), and biological measurements (e.g. blood pressure, lung function, body mass index, blood and saliva samples).**

- **Various measures of deprivation and life circumstances are also included.**

- **The ability to link this information to Scottish Morbidity Records (SMR) provides a powerful and extensive resource which can be used to study the relationships that exist between health survey factors and hospital admissions or mortality**

- **http://www.isdscotland.org/Products-and-Services/Medical-Record-Linkage/Linked-Data/**

Glasgow Centre for Population Health

GCPH projects through the life course

Breastfeeding

- 2 main aims:
  - Investigate local and national breastfeeding trends using a new linked maternal and child health dataset.
  - To investigate the unexpected increase in breastfeeding in selected deprived neighbourhoods within Greater Glasgow and Clyde.

Linked data schemes

- National Records of Scotland Births (formerly General Register Office for Scotland - GROS)
- ISD Scottish Maternity Records (SMR02)
- Child Health Surveillance Programme – Pre-school Scheme (CHSP-PS)
- ISD Scottish Morbidity Records for Neonatal and Infant Health (SMR11) and Scottish Birth Records (SBR)
- Scottish Still Birth and Infant Death Records (SSBID)

→probability matching techniques used to link these data across Scotland over a 13 year period, 1997-2009

Overview of data schemes

Predictor Variables → Outcome Variables

Geography *(NHS Board, CHP, Neighbourhood area, hospital)*

Maternal characteristics *(e.g. maternal age, marital status, ethnicity, socioeconomic characteristics, deprivation, smoking status)*

Pregnancy/Delivery characteristics *(e.g. gestation, previous pregnancies, parity, length of stay, mode of delivery, outcome, multiple birth, caesarean section,)*

Infant characteristics *(e.g. APGAR score, birth weight, congenital anomaly, neonatal/infant admission, length of stay)*

GROS

SMR02

CHSP-PS

SBR/SMR11

SSBID

Infant feeding – initiation *(first feed or feed at birth, feed on hospital discharge)*

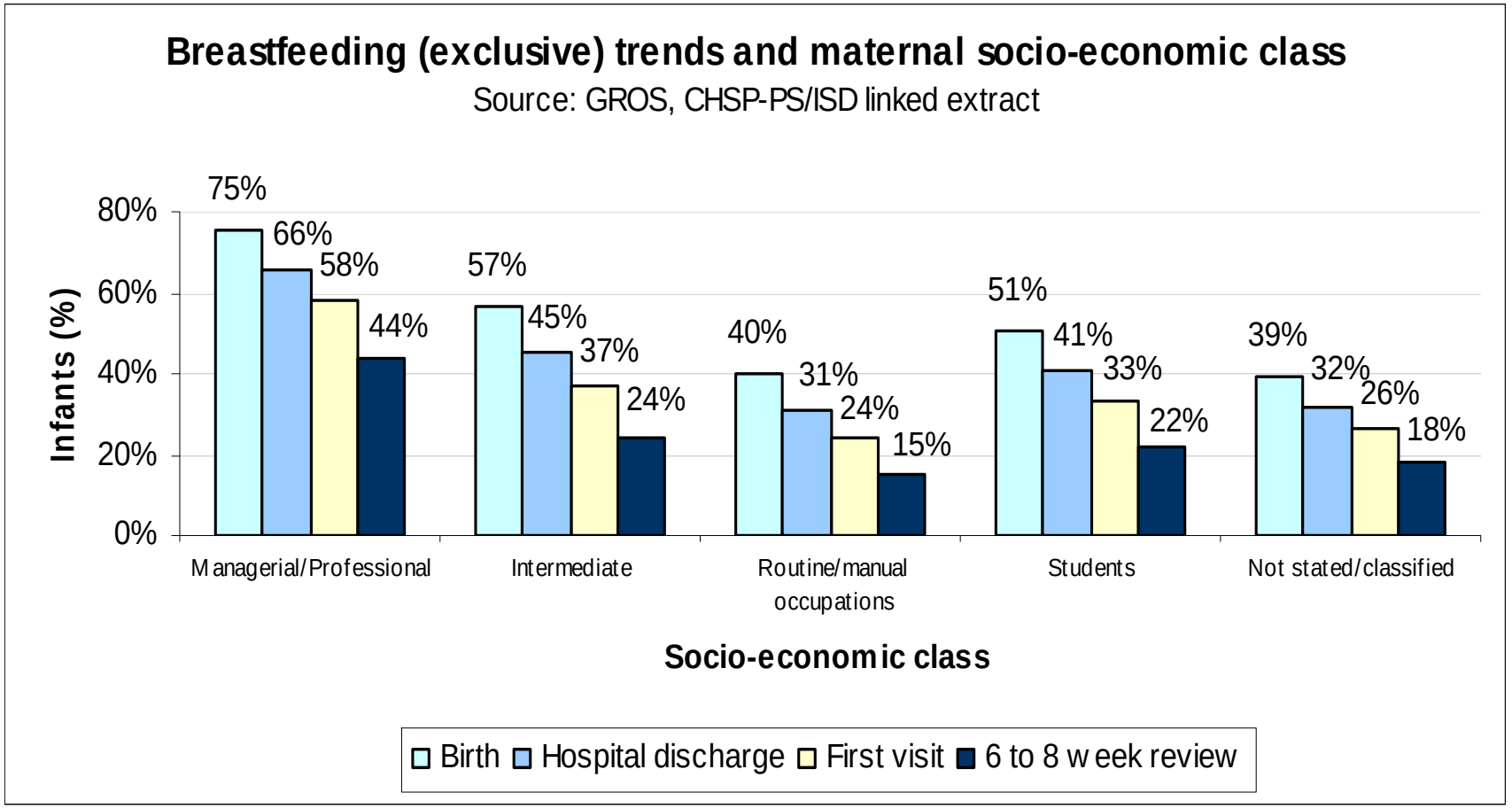
Infant feeding - duration *(feed on hospital discharge, feed at community discharge, feed at first visit, 6 to 8 week review, 8-9 month review)*

GROS – Births; SMR02 – Maternal hospital records ; *CHSP-PS* - Child Health Surveillance (pre-school); *SBR/SMR11* - Scottish Birth Record/Neonatal and infant health; *SSBID* - Scottish Still Birth and Infant Death Records

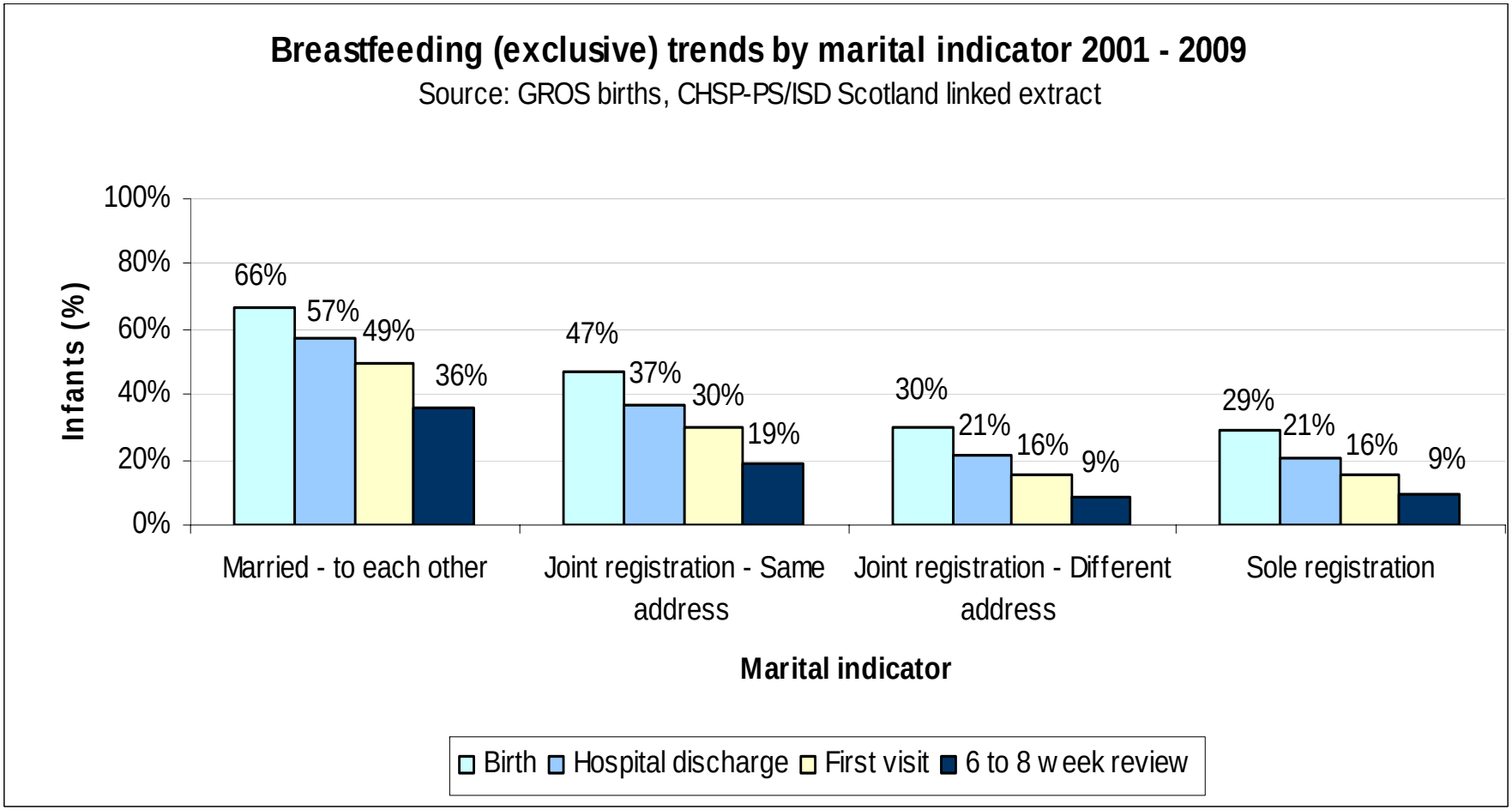
Predictors of any breastfeeding in first time mothers (singleton births): 2003 - 2009

Demographic	maternal age, paternal age, area deprivation (SIMD), mother and father's socioeconomic status, marital status, mother's country of birth (and father's), maternal religious background, year of birth
Maternal and infant health	maternal body mass index, mode of delivery, maternal health at delivery, maternal smoking status, neonatal admission, infant gestation/birth weight, infant health, infant sex, estimated gestation, mode of feeding at birth*
Health services	full baby friendly accreditation, timing of review visits*, length of postnatal stay

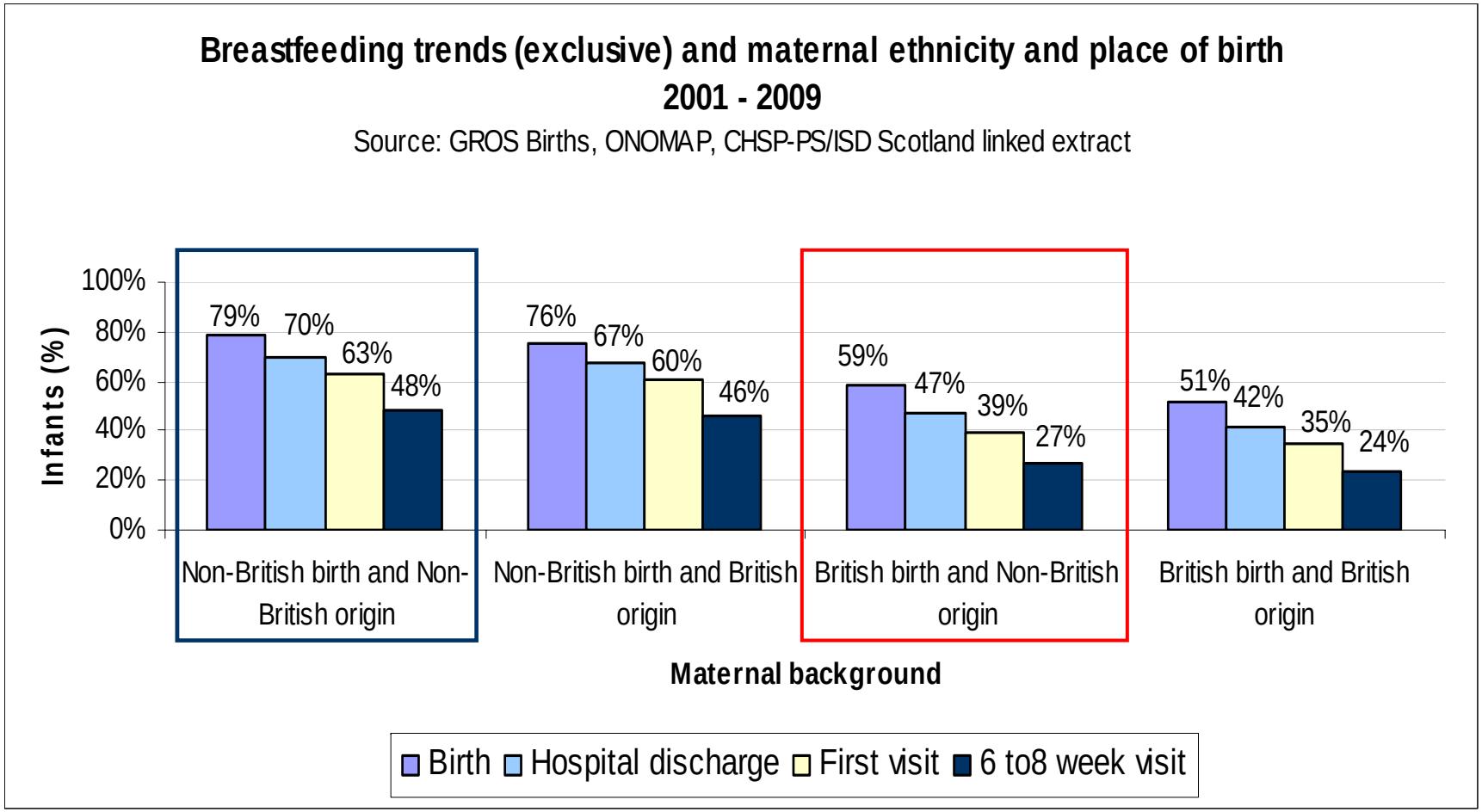
Breastfeeding trends and maternal socio-economic class



Breastfeeding (exclusive) by marital indicator



Breastfeeding (exclusive) trends and mother's place of birth and ethnicity



Future proposed work

- Additional linkage of child and maternal infant feeding cohort to hospitalisation records, GP contacts and Child Health Pre-school and School review data.

- To explore the relationship between infant feeding and early childhood health outcomes i.e. infant weight gain, illness etc.

Glasgow Centre for Population Health

Food in schools

14 January 2011 Last updated at 08:55

School lunches 'reduce truancy', pilot project finds

Keeping children in school at lunchtime encourages them to eat more healthily and reduces accidents and truancy, according to the findings of a pilot project.

Pupils were offered activities alongside healthy food

Pupils at eight Glasgow schools were kept in the grounds and offered activities alongside healthy food.

As a result, more children ate school meals and staff reported less truancy and improved safety.

The pilot has now been rolled out to a further seven schools.

The pilot scheme, organised by Glasgow City Council, the Scottish Centre for Social Research and the Glasgow Centre for Population Health, was carried out among S1 pupils between August 2009 and June last year.

It was also found that pupils enjoyed the lunchtime activities and said there was less pressure to go out even if they did not want to.

The study found there was also less bullying and teasing and staff reported reduced lateness for class.

Related stories

School meals 'help fussy eaters'

School meals get 'deli' makeover

More pupils taking school dinners

Healthy School Food Policy
The ‘Big Eat In’

- One year pilot in 8 Glasgow secondary schools during 2009/2010 academic year
- First year pupils ‘encouraged’ to stay on the school premises at lunch-time
- Aim to provide a healthy, enjoyable experience over school lunch times for new secondary pupils in transition.
- Evaluation assessed the impact of the ‘Big Eat In’ on secondary pupils’ attitudes and behaviour regarding their lunchtime experience, school meals, and healthy eating and elicit views of parents/carers and school staff regarding the pilot

Pupils' Views

- Majority positive, school meals regarded as healthy and good value for money

Because like a lot of the stuff's like freshly made so like you know what's going into it and there's no anything like extra salt or that in it…

- Some evidence of 'being won over' in terms of trying new food

- Lunchtime activities very popular

You get to choose what you want to do. You can go up to the library, you can go into the gym hall, you can play badminton on a Monday and all that

- Positive effects of staying in school – less pressure to go out

…you get to have a laugh and all that and you don't need to just go outside in the cold, you can actually do something at lunchtime

Parents'/Carers' Views

- Safety; structure and reassurance

Well I know exactly where my daughter is at lunchtime,.I'm not kind of left wondering 'oh is she at the shops or has she went to a friend's house' or whatever…so from a parent's point of view it's peace of mind…..

- Overcoming peer pressure

I know that X wanted to stay in at lunchtime anyway but some of her other friends might have been going out, but… it's kind of taken the emphasis off her, she's kind of able to say "well the teachers would prefer us to stay in, so this is just what I'm going to do."

Conclusions

- S1 school meal uptake rates higher than for previous year and uptake rate sustained for longer than expected
- Some positive impacts on other year groups
- Variation between schools
- Potential local influences
  - Availability of food outside school
  - School culture (staff and pupils)
  - Physical design of school canteen
  - Organisation of lunchtime within school day

Further work: Food Outlet Research, September 2011

How does the quality of food purchased by secondary school pupils from outlets near Glasgow secondary schools compare with mandatory nutrient standards set for food and drinks provided by schools in Scotland?

Glasgow Centre for Population Health

Young people

Lifecourse – youth and young adulthood

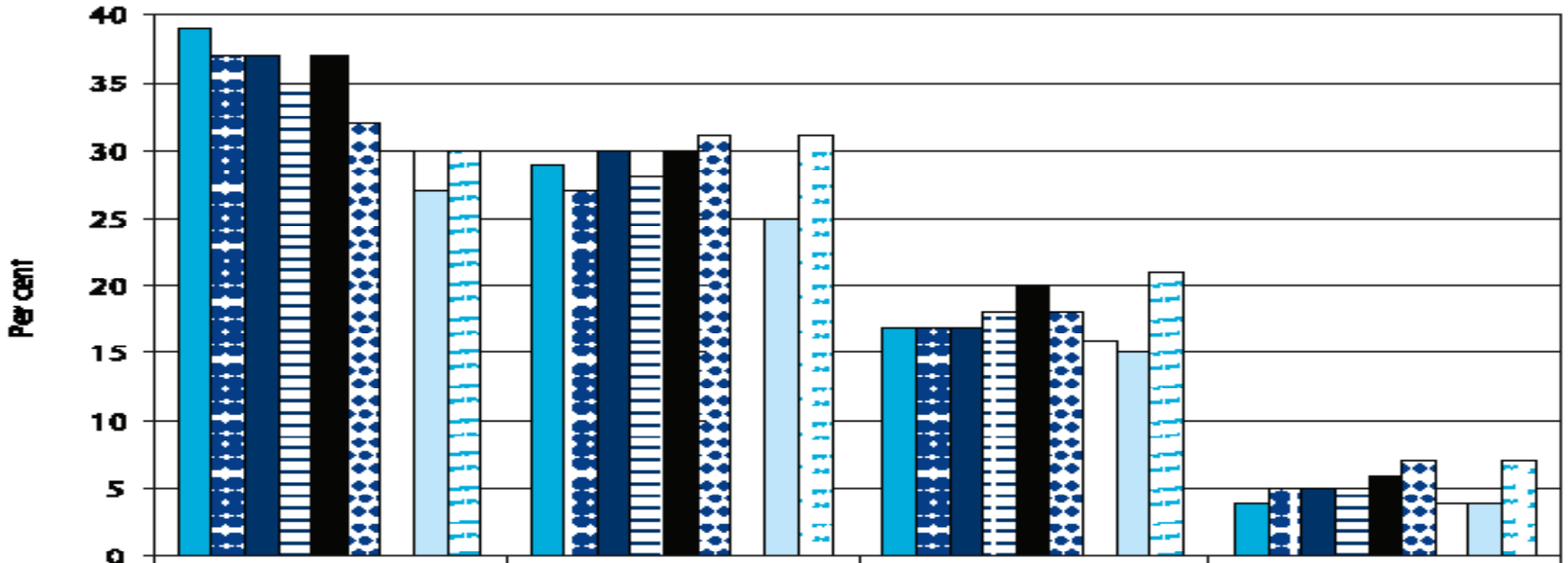
- Recognition that life phases are not static and changing relationships to wider economy can produce health and wellbeing challenges e.g. young adulthood, later years.
- What are health challenges and resilience factors in young adulthood?
- Youth gangs?
- Alcohol?
- Plans to explore changing experience of later years through lens of alcohol use

Glasgow Centre for Population Health

Enactment of young adulthood and alcohol use are overlain

Glasgow Centre for Population Health

Trends in the proportion of men in Great Britain drinking more than eight units on any one day in the last week, 1998 to 2006, by age



	16–24	25–44	45–64	65 and over
1998	39	29	17	4
2000	37	27	17	5
2001	37	30	17	5
2002	35	28	18	5
2003	37	30	20	6
2004	32	31	18	7
2005	30	25	16	4
2006o	27	25	15	4
2006i	30	31	21	7

Age group

Alcohol across the life course

- Is apparent reduction in young adult consumption a case of polarisation or “more alcohol down fewer throats”?
- Qualitative work highlights shared cultural drivers around alcohol with different (SES - Socio-Economic Status) choice environments in which to enact them.
- Evidence of higher risk alcohol environments compounding marginalisation from labour market. i.e. violence, convictions
- Problems in “moving on” from young adult identities and attendant risks – contracting youth labour market?

Glasgow Centre for Population Health

Adult Mental Health profile of Greater Glasgow and Clyde

Context

National action plan

National framework

Previous report >10 years ago

NHS HS National Framework

Table 2 **Framework of adult mental health indicators (number of indicators in brackets)**

HIGH LEVEL	
Positive mental health (2)	Mental health problems (7)

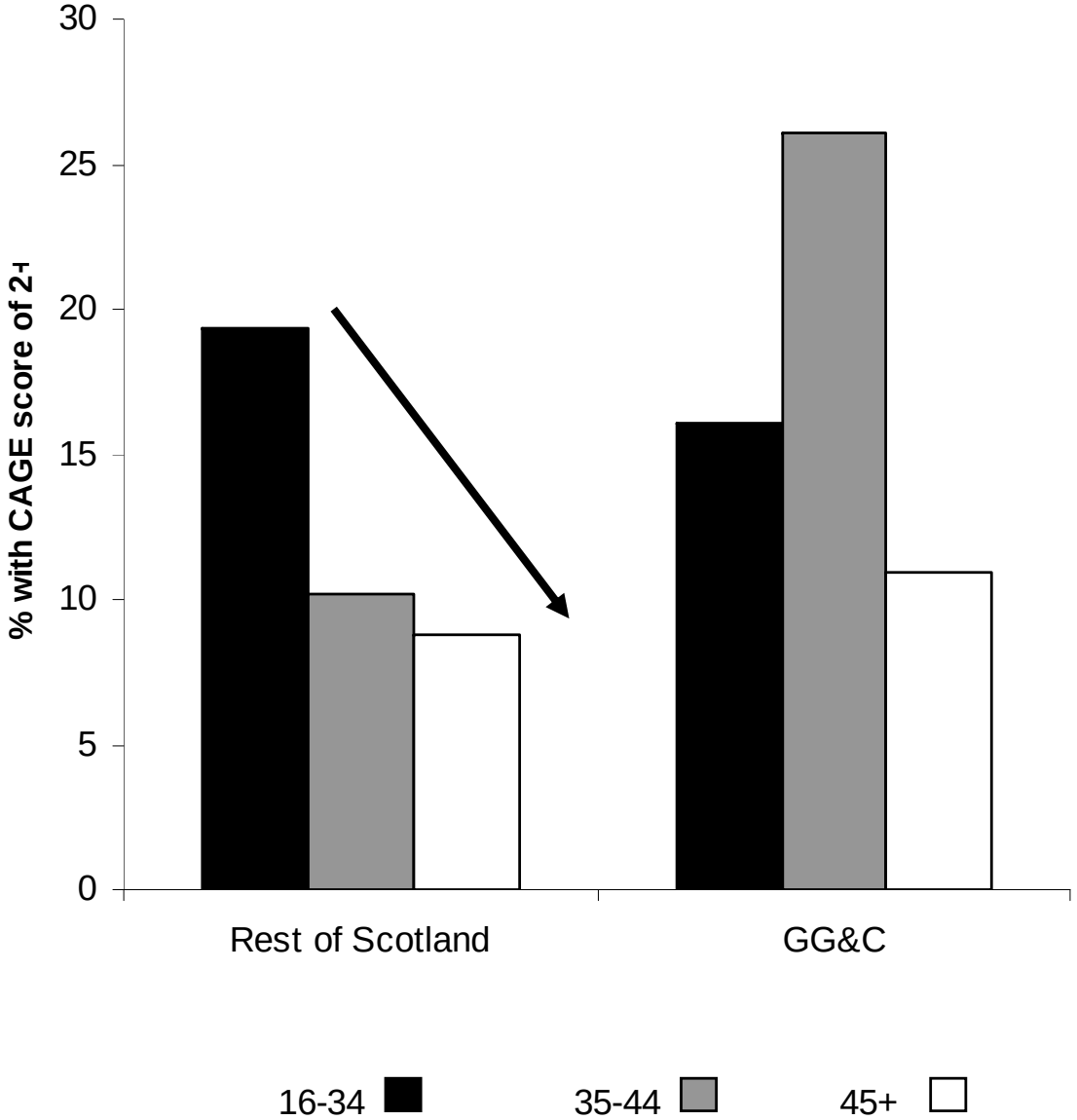
CONTEXTUAL		
Individual	**Community**	**Structural**
Learning and development (1)	Participation (3)	Equality (1)
Healthy living (4)	Social networks (1)	Social inclusion (2)
General health (3)	Social support (2)	Discrimination (3)
Spirituality (1)	Trust (2)	Financial security/debt (2)
Emotional intelligence (1)	Safety (4)	Physical environment (6)
		Working life (6)
		Violence (3)
Socio-demographic analysis across all indicators, where possible, by gender, age and area deprivation or socio-economic status.		

GCPH augmented with locally available data

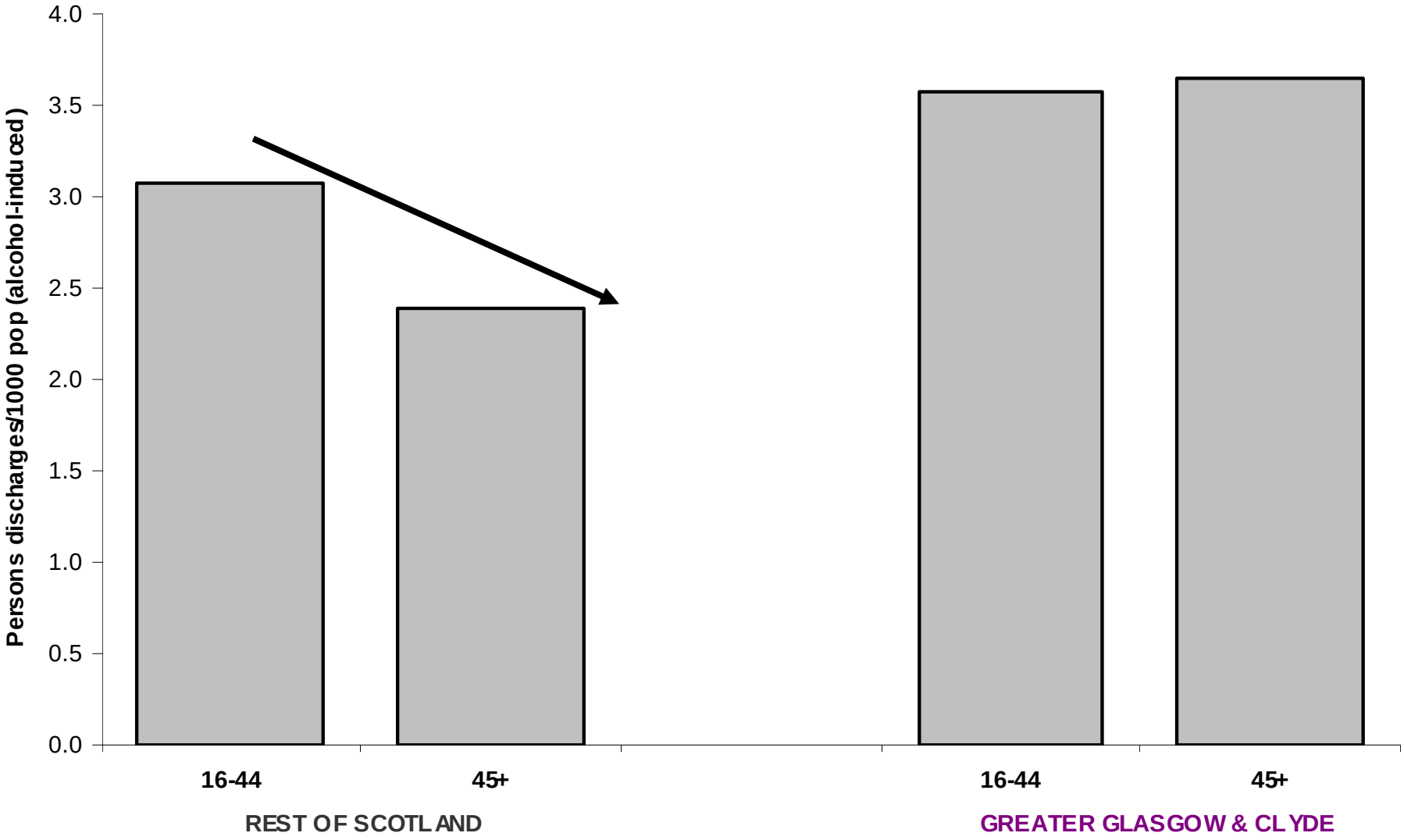
Drug & Alcohol

Prolonged association with drugs and alcohol in GG&C

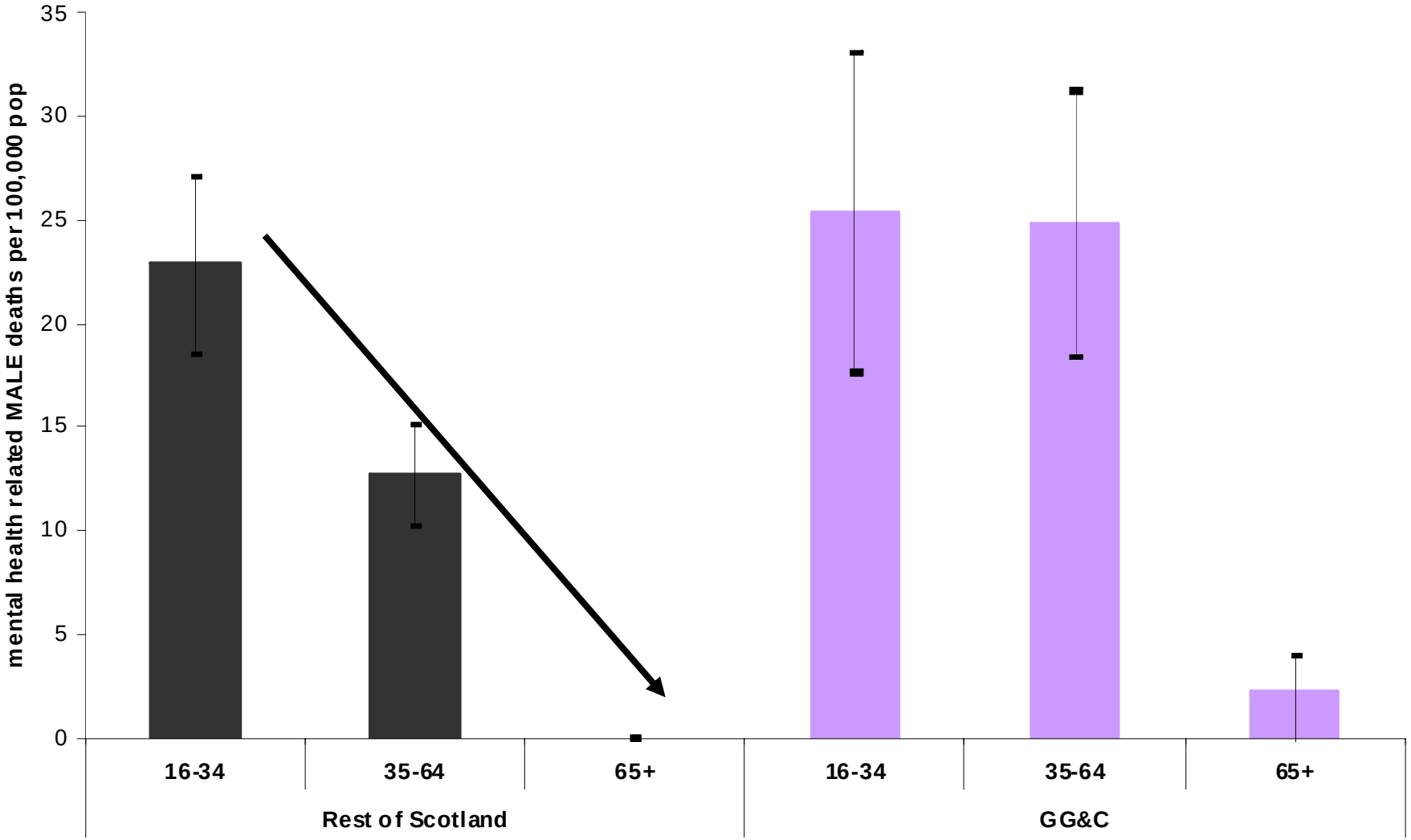
Alcohol Dependency (men)



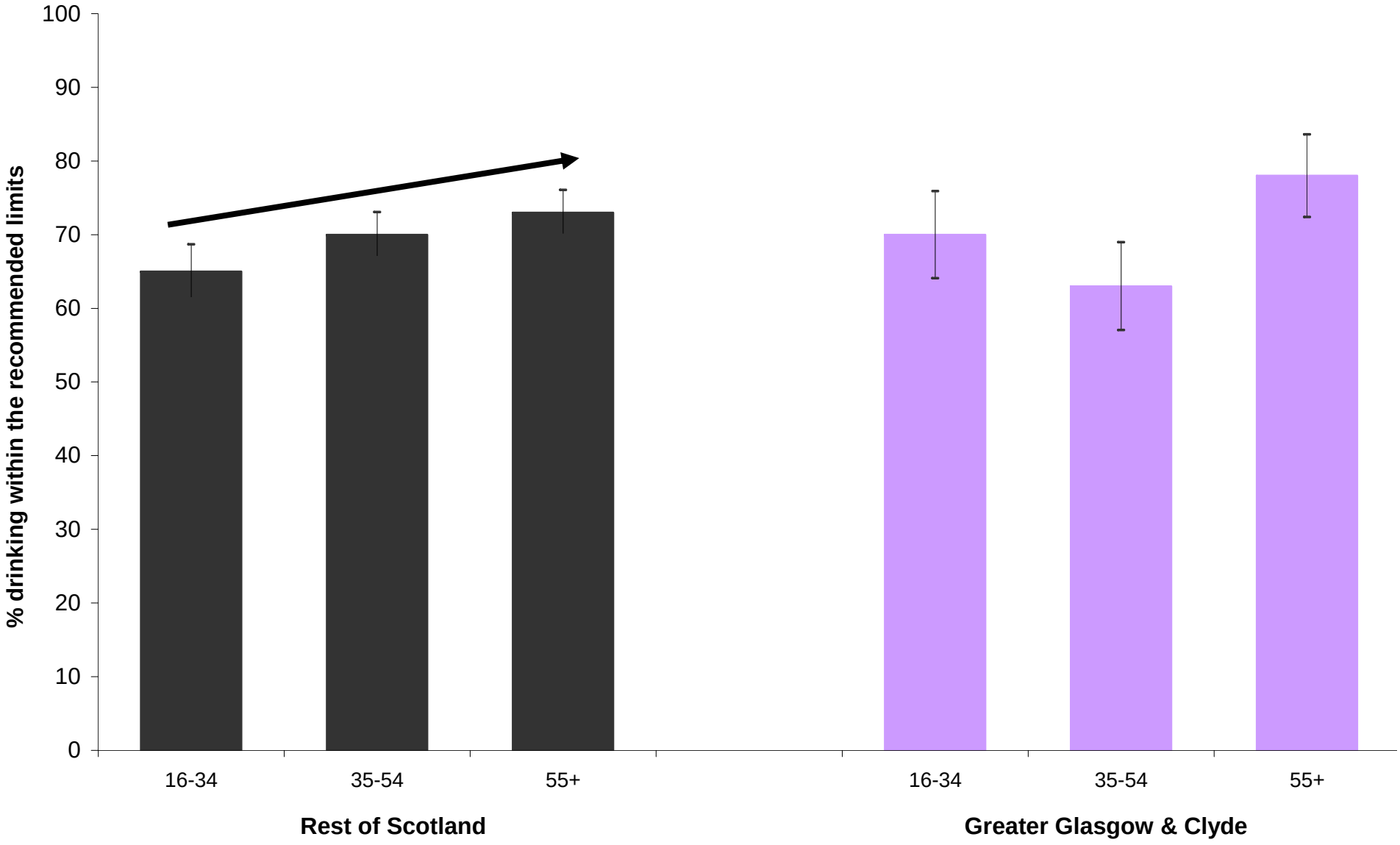
Alcohol-related MH hospital episodes



Drug-related mental health deaths (males)



Alcohol consumption – within limits



Glasgow Centre for Population Health

pSoBid

pSoBid

The psychological, social and biological determinants of ill-health study

Objectives:

- To examine the associations between classical and novel risk factors and health outcomes, and the interactions between determinants
- To assess the extent to which the gap in health outcomes can be explained by these factors
- To yield insights into new approaches which might help address Glasgow's health record

Sampling

Cross-sectional, population-based study

Final achieved sample: 666

Two groups:

(i) 'Affluent' (Least Deprived): from 5 practices with highest % patients in top 20% SIMD 2004 (n=342) (Response rate – 34%)

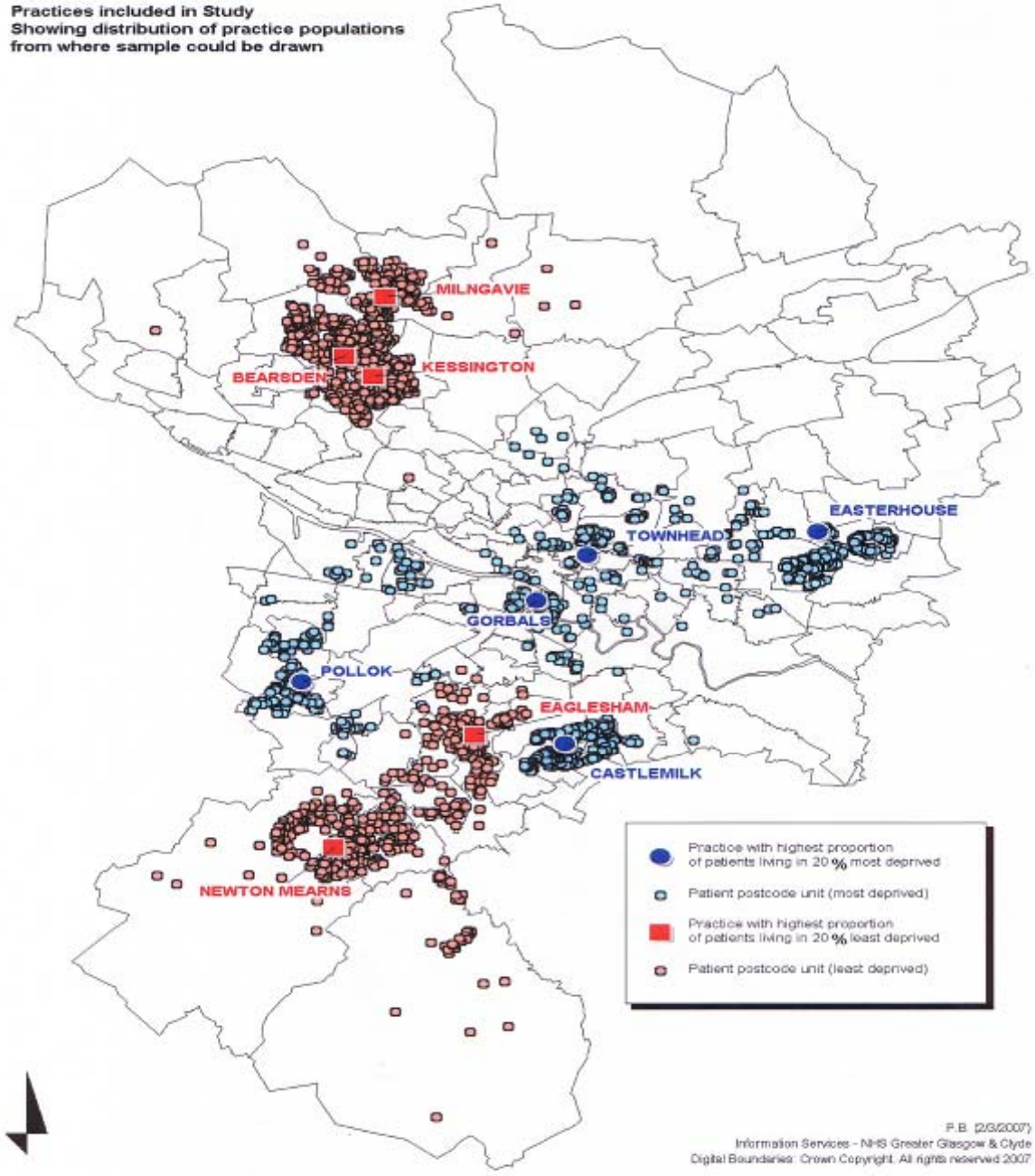
(ii) 'Deprived' (Most Deprived): from 5 practices with highest % patients in bottom 5% SIMD 2004 (n=324) (Response rate – 20%)

Three age groups:

35-44 years; 45-54 years; 55-64 years

Glasg
Centr
Popul
Healt

Practices included in Study
Showing distribution of practice populations from where sample could be drawn

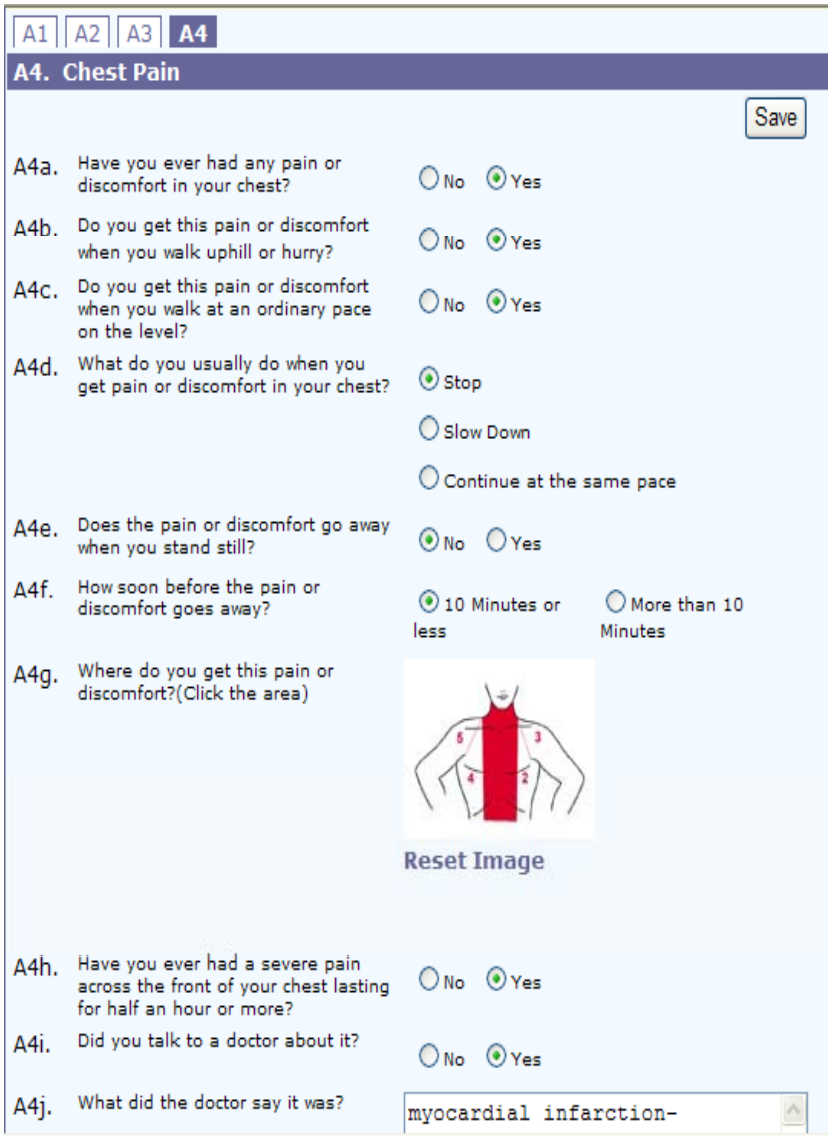


P.B. (2/3/2007)
Information Services - NHS Greater Glasgow & Clyde
Digital Boundaries: Crown Copyright. All rights reserved 2007

Data collection

Visit 1:

- Demographic information and lifestyle questionnaire
- Mid thigh diameter and hip and waist measurements carried out; blood pressure recorded; FEV and FVC measured
- Psychology questionnaires self completed:
  - The GHQ 28
  - Sense of Coherence (SoC) Questionnaire
  - Beck's Hopelessness Scale
  - Generalised Self-efficacy Scale



Data collection

Visit 2:

- Fasting blood sample taken; then breakfast
- Weight, height, leg length,
- Personality questionnaire (EPR), Rosenberg self-esteem scale
- Cognitive function assessment:
  - Stroop Task
  - Trails Test (version 'Trail B')
  - Choice Reaction Time (CRT)
  - Auditory Verbal Learning Test (AVLT)
  - NART II (National Adult Reading Test – 2nd edition)
- Assessment of carotid artery intima-media thickness (cIMT)

Visit 3:

- MRI scans (small subsample) (n=42)

Summary conclusions

pSoBid participants recruited from deprived vs affluent areas of the city exhibited differences in:

Social characteristics

- Individual variation in education, income and home ownership between groups;
- Differences in early life conditions identified especially in relation to overcrowding and leg-length maybe linked to biological changes in adulthood.

Biology:

- Surprisingly, classical risk factors such as cholesterol and blood pressure did not differ between the groups;
- New risk factors related to chronic inflammation and arterial endothelium were higher in deprived areas and were linked to biomarkers of chronic disease;
- No difference was noted in the thickness of the artery wall between groups but outcomes such as the presence of artery wall plaque (indicator of heart disease) was higher in participants from more deprived areas.

Psychology & Cognition:

- Those in deprived areas performed less well in tests of cognitive performance;
- Scales assessing mental wellbeing gave poorer scores for ‘hopelessness’, ‘self efficacy’, ‘sense of coherence’ and ‘self-esteem’ in participants from more deprived areas.

Glasgow Centre for Population Health

Go Well

GoWell is…

…a longitudinal research and learning programme investigating housing improvement and neighbourhood transformation in Glasgow - ***with a particular focus on studying the impact on the health and wellbeing of people*** and communities of the investments made by Glasgow Housing Association (GHA), housing/community managers and their partners

GoWell's significance

- Longitudinal study (tracking over time and examining relationships)
- Focussed on most deprived and least healthy communities
- Broad in scope: covering range of issues
- Multi-method
- A partnership between different organisations
- Glasgow focus and national relevance

Research objectives

- To investigate how regeneration and housing investment affect individual and household health and wellbeing.
- To assess the degree to which places are transformed by policy interventions.
- To understand the processes that support cohesive, sustainable communities.
- To monitor the effects of interventions on area-based inequalities within the city.
- To develop and test research methods.

Research components

- Community health and wellbeing survey and focus groups every 2-3 years.
- Longitudinal study of remainers, outmovers and incomers.
- Ecological monitoring of health and other social change across Glasgow.
- Qualitative research: Governance, empowerment and participation study; ‘Lived Realities; mixed tenure; young people.

Emerging messages…..what seems to matter to people

- **Physical renewal**
  - the built form, quality, aesthetics, amenities
- **Services equally if not more important**
  - How housing/neighbourhoods are managed and maintained (responsiveness and customer care providing respect and empowerment)
- **Social regeneration**
  - personal support for isolated and vulnerable people
  - help to generate local voluntary and community groups (self-help; learning; creative; leisure)
  - community development work which builds residents' capacity to influence decisions and events in their area

In summary

- While prospective birth cohort studies are the gold standard, more often other less expensive approaches have to be used
- Record linkage of administrative data is a helpful approach which is being used increasingly in Scotland
- GCPH has employed a range of approaches (repeat cross-sectional surveys, longitudinal studies, record linkage, qualitative research) to understand different aspects of the life course.

Further Information

GCPH www.gcph.co.uk

GoWell www.gowellonline.com

pSobid http://www.gcph.co.uk/work_programmes/psobid

email - bruce.whyte@drs.glasgow.gov.uk