Making sexual health policy & practice evidence-based: why & how

Dr Cath Mercer
UCL Centre for Population Research in Sexual Health & HIV
c.mercer@ucl.ac.uk

BASHH DipGUM course – Module 1:
Epidemiology of STIs & Bacterial Infections
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Learning objectives

• To understand why sexual health policy and practice need to be evidence-based
• To be aware of the different types of evidence needed to understand the sexual health needs of a local population
• To be aware of the data sources available to provide this evidence
• …and to understand their strengths & weaknesses
• To cement knowledge & understanding of key epidemiological concepts acquired from completing the eLfH modules
How would you answer these questions?

• What type - or types - of sexual health services maximise sexual well-being in a local population? Specialist? Community-based? Online?

• How does this combination of services vary in different demographic and geographic settings?

• How can commissioners know which combination of services will maximise health gain in their locality, both in terms of:
  • Improving the health of the individual
  • Benefitting the wider population (public health)

Challenging as sexual health is an umbrella term for...

"Sexual health is an integral part of overall health, well-being and quality of life. It is a state of physical, emotional, mental and social well-being in relation to sexuality, and not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all people must be respected, protected and fulfilled.

Much remains to be done to ensure that public health policy and practices recognize and reflect this."
...and sexual health is just one component of public health

...and an individual’s general health & well-being

Interpretation: "Poor health is independently associated with decreased sexual activity and satisfaction at all ages in Britain. Many people in poor health report an effect on their sex life, but few seek clinical help. Sexual lifestyle advice should be a component of holistic health care for patients with chronic ill health"
Evidence of syndemics

Definition: “A syndemic or synergistic epidemic is the aggregation of two or more concurrent or sequential epidemics or disease clusters in a population with biological interactions, which exacerbate the prognosis and burden of disease”

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• The evidence needed
• Gaining this evidence:
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• The case for data triangulation
• Conclusions

Overview
Evidence is needed on sexual behaviour

- Sexual behaviour is a key determinant of the transmission potential of a STI, which is important not just in terms of an individual’s health but also for public health.
- We can quantify the likelihood an infection (e.g. a STI) is passed on using the ‘case reproduction number’ or the ‘base reproduction rate’.
- This is often expressed as ‘$R_0$’ and is defined as the number of secondary (new) infections produced by one case of infection in a totally susceptible population.

Reference: Heathcoate & York, 1984

The equation behind $R_0$:

$$R_0 = \beta \cdot c \cdot D$$

(read as: ‘beta’ times ‘c’ times ‘D’)

- $\beta$ = Probability (probability) of transmission of infection
- $c$ = Number of contacts (i.e. number of sexual partners for a STI)
- $D$ = Duration of infectiousness
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$c = \text{Number of contacts (i.e. number of sexual partners for a STI)}$
$D = \text{Duration of infectiousness}$

...are there any other sexual behaviours that might influence $R_0$...and how?

Other sexual behaviours that might influence $R_0$:

- Type of sexual practices engaged in ($\beta$)
- Whether – and how well – condoms are used ($\beta$)
- Timing of sexual contacts/partners ($\beta / c / D$)
- Who individuals have sex with in terms of:
  - Age
  - Gender
  ...determines an individual’s position in the sexual network
Almost all sexual practices involve someone else

Sex with someone else exposes an individual to their partners, and their partners’ partners…

At an individual-level…
At an individual-level…

Behaviour of individuals → STI incidence

Biology of organism

Recap from eLfH: what does this mean?

Incidence (rate) is the number of new cases in a population at risk over a given time period (e.g. over the past year).
Having data on sexual behaviour is important as:

A key determinant of STI transmission
- \( R_0 = \beta c D \)
- To identify the contribution of behavioural change to STI prevention and control

...but also to understand the wider aspects of sexual & reproductive health:
- Contraception needs
- Sexual enjoyment, sexual dysfunction
- Human sexuality and its determinants

...as per the WHO definition of sexual health
Also need evidence that *contextualises* sex & sexual healthcare seeking behaviour

- The age-gender structure of the population
- Ethnic composition
- Prevalence of ‘core groups’ (e.g. MSM, CSWs, …)
- Employment profile
- Transport links
- How does this change over time? Daily? Seasonally?
  - Commuter towns
  - University towns
  - Seaside resorts

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Why is it challenging to gain this evidence?

- Sexual behaviours are private, not directly observable, socially censured

“…would invade the privacy of the 20,000 people due to be questioned.”

Source: The Sunday Times, 10 Sept 1989
Why is it challenging to gain this evidence?

• Sexual behaviours are private, not directly observable, socially censured

• Sexual behaviours are often ill-defined (e.g. what constitutes a ‘sexual partner’? What constitutes ‘sex’?)

“I did not have sexual relations with that woman.”

Why is it challenging to gain this evidence?

• Sexual behaviours are private, not directly observable, socially censured

• Sexual behaviours are often ill-defined

• Behaviour is very variable and those at highest risk of STI acquisition and transmission (‘core groups’) are often ‘hidden populations’ and difficult to access and sample (e.g. MSM, CSWs and their clients, ...)
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Using surveillance data

• Data routinely-collected by Public Health England for STI surveillance via Genitourinary Medicine Clinic Activity Dataset (‘GUMCAD’)

• Electronic data return from Level 2 and 3 services to PHE of anonymised patient-level information, largely services provided to the patient & test results but current version includes some behavioural data

• Similarly, PHE-collated Sexual and Reproductive Health Activity Data Set (‘SRHAD’) of contraceptive and sexual health data (formerly the annual, aggregate KT31 return)
Discuss with your neighbours:

Why can’t you just use surveillance data to understand the sexual health needs of your locality?
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1. Surveillance data doesn’t consider sexual well-being in its broadest sense

2. Limited data collated – especially regarding sexual behaviour
Why can’t you just use surveillance data to understand the sexual health needs of your locality?

3. Surveillance data doesn’t collate data from all sexual healthcare providers, including online.

4. Collates data from those who attend services, not everyone who has a sexual health need.
Just capturing the tip of the iceberg?

E.g. in the context of STIs…

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Is Natsal the ‘golden ticket’?

Natsal* - a very brief overview

* National Surveys of Sexual Attitudes & Lifestyles = Britain’s probability cross-sectional sample survey of sexual behaviour
Changes in sexual attitudes and lifestyles in Britain through the life course and over time: findings from the National Surveys of Sexual Attitudes & Lifestyles (Natsal-3)

Prevalence, risk factors, and uptake of interventions for sexually transmitted infections in Britain: findings from the third National Survey of Sexual Attitudes & Lifestyles (Natsal-3)

The prevalence of unplanned pregnancy and associated factors in Britain: findings from the third National Survey of Sexual Attitudes & Lifestyles (Natsal-3)

Lifetime prevalence, associated factors, and circumstances of non-volitional sex in women and men in Britain: findings from the third National Survey of Sexual Attitudes & Lifestyles (Natsal-3)

Sexual function in Britain: findings from the third National Survey of Sexual Attitudes & Lifestyles (Natsal-3)

Source: The Lancet, 26 November 2013 – available on an open-access basis

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Recap from eLH: what does this mean?
Natsal* - a very brief overview

* National Surveys of Sexual Attitudes & Lifestyles = Britain’s probability cross-sectional sample survey of sexual behaviour

Recap from eLfH:

A survey undertaken at one point in time to provide a snap-shot of what’s going on in the population

.....where everyone has the same probability (‘chance’) of being selected to participate

...so data are representative of target population

...but expensive & time-consuming to do!

Natsal – a very brief overview

• General population sample design

• Thousands of addresses selected within randomly-selected sectors from the Postcode Address File

• Letters sent to selected households 1-2 weeks in advance of a highly-trained interviewer calling

• Interviewer screens each household for people of eligible age and randomly selects 1 person per household to participate

• Interview lasts ~1 hour & begins with a face-to-face interview then a self-completion section, and ends with another face-to-face interview

• Respondent receives £15 (in Natsal-3) as a token of appreciation.
The 3 Natsal surveys to date

<table>
<thead>
<tr>
<th></th>
<th>Natsal-1</th>
<th>Natsal-2</th>
<th>Natsal-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age range</td>
<td>16-59</td>
<td>16-44</td>
<td>16-74</td>
</tr>
<tr>
<td>Sample size</td>
<td>18,876</td>
<td>11,161</td>
<td>15,162</td>
</tr>
<tr>
<td>Data collection</td>
<td>Paper (PAPI)</td>
<td>Computer (CAPI &amp; CASI)</td>
<td>CAPI &amp; CASI</td>
</tr>
<tr>
<td>Urine sampling</td>
<td>No</td>
<td>Yes for CT only</td>
<td>Yes for CT, GC, HPV, M.Gen &amp; HIV</td>
</tr>
<tr>
<td>Response rate</td>
<td>66.8%</td>
<td>65.4%</td>
<td>57.7% (but 64.8% among those aged 16-44)</td>
</tr>
</tbody>
</table>

Data in each survey weighted to be representative of British population (in terms of gender, age, and region) according to the Census

Natsal’s question topics

• Initial face-to-face interview:
  *Less sensitive topics:*
  • General health (incl. drinking & smoking)
  • Family structure when growing-up
  • Learning about sex
  • First sexual experiences
  • Use of contraception
Natsal’s question topics

• Initial face-to-face interview

• Self-completion using CASI:

  More sensitive topics:
  • Heterosexual practices
  • Homosexual practices
  • Numbers of opposite-sex partners
  • Numbers of same-sex partners
  • Characteristics of most recent partnerships
  • Travel & sex abroad
  • Non-consensual sex
  • Paying for sex
  • History of pregnancies
  • Unplanned pregnancy
  • STIs & HPV vaccinations
  • Drug use (incl. IDU)
  • HIV testing
  • Sexual (dys)function
  • Viagra use
  • Mood and well-being

NB: New topics for Natsal-3

Natsal’s question topics

• Initial face-to-face interview

• Self-completion using CASI

• Last face-to-face interview:

  Less sensitive topics:
  • Attitudinal questions
  • Household classification
  • Occupation
  • Education/qualifications
  • Religion
  • Ethnicity
Further info on Natsal-3’s methods:

Methodology of the third British National Survey of Sexual Attitudes and Lifestyles (Natsal-3)

Bob Erens, 1,4 Andrew Phelps, 2 Soazig Clifton, 1,2 Catherine H Mercer, 1 Clare Tanton, 1
David Hussey, 2 Pam Sonnenberg, 1 Wendy Macdowall, 1 Nigel Field, 1 Jessica Datta, 1
Kirstin Mitchell, 2 Andrew J Copas, 1 Kaye Wellings, 2 Arne M Johnson 1

Consistency in reporting sensitive sexual behaviours in Britain: change in reporting bias in the second and third National Surveys of Sexual Attitudes and Lifestyles (Natsal-2 and Natsal-3)

Philip Prah, 1 Andrew J Copas, 1 Catherine H Mercer, 1 Soazig Clifton, 1,2 Bob Erens, 1,3
Andrew Phelps, 2 Clare Tanton, 1 Pam Sonnenberg, 1 Wendy Macdowall, 4
Kaye Wellings, 2 Arne M Johnson 1

Also: www.natsal.ac.uk
Natsal is unique because it tells us about:

- Prevalence of infection in the population
- Uptake of services & interventions
- Demographic & behavioural risk factors
Definition recap:

Prevalence = \[
\frac{\text{No. of cases at a specific point in time}}{\text{No. of people in the population of interest at that point in time}}
\]

…so sometimes called ‘point prevalence’

*Remember:*

1) the **numerator** is the **total** number of cases of disease, not just new cases

2) the **denominator** is not a measure of time so prevalence is never a rate & so should not be expressed as prevalence rate

(Population) prevalence estimates of different STIs in men & women aged 16-44
Natsal allows us to examine how prevalence varies by demographic factors, e.g. age & sex...

...& by behavioural factors, e.g. numbers of sexual partners:
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NB: as most people (85% of men; 90% of women) have at most 1 partner in the last year, 43% in men & 60% of CT in women was in people with just 1 partner in the last year.

Not just STI prevalence data but survey data on service use & behaviour

E.g. CT testing in the past year reported by 54% of women & 35% of men aged 16-24 but varied by number of partners.
HIV testing

Natsal allows us to look at changes over time in self-reported HIV testing

HIV testing in the past 5 years

...& by taking account behavioural data, we can examine whether the increases in reported HIV testing are greater among those at highest risk

HIV testing, past 5 years (people aged 16–44)
HIV testing

Good news is that increases in reported HIV testing have been greatest among those targeted by policy, e.g.:

Sexual health clinic attendance

A similar story: Increases in reported attendance compared to Natsal-2
Sexual health clinic attendance

... & increases in reported attendance again greatest in those at highest risk

Discuss with your neighbours:

What are the limitations of using Natsal for evidence on sexual behaviour?
Some limitations:

- As a general population survey covering all aspects of sexual health, it’s not possible to ask about every possible sexual behaviour.

- Small numbers of people in some ‘core groups’, e.g. Natsal-3 only included 190 MSM in its sample of >15,000 people.

- The number of Natsal-3 participants is too small to analyse at a local level (but can look at area types to make inferences about a locality, e.g. university town, deprived seaside town, …)

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The case for data triangulation

…the example of the Health Protection Research Unit in BBVs and STIs (http://bbsti.hpru.nihr.ac.uk)

- World class national surveillance & behavioural research data:
  - GUMCAD (Genitourinary Medicine Clinic Activity Dataset)
  - GRASP (Gonococcal Resistance to Antimicrobials)
  - Natsal 1-3 (National Surveys of Sexual Attitudes and Lifestyles)

- Despite this, limited information on:
  - contextual factors which influence risk and risk reduction
  - how sexual risk interplays with partnership types, social and sexual networks, drug and alcohol use

- There is need for evidence on the potential for social, behavioural and clinical interventions to foster behaviour change
Aim

To improve our understanding and knowledge base of the behaviours, attitudes and factors that influence the risk of STI and BBV acquisition and transmission in key population groups to inform the development of novel interventions and support the targeting and delivery of timely interventions to maximise patient and public health benefit.

Method: ‘Rapid risk assessment system’

5 steps:

1. Evidence reviews (incl. Natsal) of STI/BBV risk in key populations
   ...this informs:

2. Qualitative research with individuals in key populations to understand the context surrounding risk and attitudes to risk
   ...this informs:

3. Development and implementation of patient surveys in purposively-selected GUM clinics across England
   ...which enhances evidence from STI surveillance (GUMCAD) by:

4. Linking patient survey data to GUMCAD data to enhance STI testing/diagnosis/ PN outcome data
   ...to inform evidenced-based interventions:

5. Develop & deliver effective interventions to reduce STI transmission
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5. Develop & deliver effective interventions to reduce STI transmission

Recap from eLH: what does this mean?
A convenience survey of people attending GUM

Recap from eLfH:

No need for a sampling frame as the sample is selected for convenience
...so everyone in target population does not have an equal chance (‘probability’) of being sampled
...so data are not representative of target population
...but relatively cheap & quick to undertake

...opposite to a probability sample survey, e.g. Natsal

Mathematical modeling to ‘formally’ triangulate data

• Powerful tool that can:
  - take account of data from multiple sources simultaneously (e.g. Natsal, census, GUMCAD, etc)
  - test out different scenarios, e.g. impact of opening a university on STI incidence

• Limitations:
  - estimates / forecasts are only as good as the data entered into the model
  - need to make clear the assumptions underlying the model (so it’s not a ‘black box’)
  - models need to be validated
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Conclusions

- To understand the sexual health needs of a locality requires evidence not just of the sexual behaviour of the population but also the context of sex and sexual health

- There is no one, perfect data source – it depends on population of interest & the question(s) being asked

- Data from a number of sources already exist that can be collated (either informally (e.g. HPRU study) or formally (e.g. mathematical models) so that sexual health policy and practice decision-making can be evidenced base.
Questions? Comments?