Finland, Great Britain, Italy, Luxembourg, the Netherlands and Poland between May 2005 and September 2006.

Methods

Participants were recruited by random digit dialing, faceto-face interview or via population registers. Participants were asked to record on a paper diary the age, gender, duration, location, frequency and type of contact during a randomly assigned day. Main effects of covariates (age, sex, household size, country) on numbers of contacts were assessed using multiple negative binomial regression.

Results

A total of 7290 diaries were collected covering all age groups with a total of 97 940 recorded contacts (mean = 13 per participant per day). There was a consistent pattern of contact frequency by age, with a gradual rise in the number of contacts in children, a peak among 14-19 year olds, followed by a fall to a lower plateau in adults and a sharp decrease after 55 years of age. Larger household size and weekdays were associated with larger number of contacts. Longer duration and/or physical contacts were more stable in time and were often made in the home, school or leisure settings. Shorter duration contacts tend to be made less frequently, are less likely to involve physical contact and more likely to occur in work or other settings. The 2-dimensional 'who mixes with whom' age structure was dominated by diagonal pattern of participants preferentially contacting people in their own age group.

Conclusions

The overall pattern of number of contacts by age showed a remarkable consistency over the eight surveyed countries although the mean number of contacts differed by more than factor of 2 probably due to varying survey methodologies. The quantification of these mixing patterns represents a significant advance in our understanding of the spread of these infectious diseases.

Comparison of contact profiles across seven European countries and implications for modelling the spread of airborne infectious diseases Miriam Kretzschmar

M Kretzschmar, RT Mikolajczy

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Within a network of the EU funded project POLYMOD we performed a survey of social contacts in seven European countries. The results concerning age-dependent contact frequencies and mixing will be used as an input for mathematical modelling of airborne infectious diseases. Methods

Representative surveys were performed in seven countries to assess the number of social contacts, using a diary approach in which participants had to record individual contacts along with some additional information. We used the information on the reported numbers of contacts in six different settings (household, work, school, leisure, transportation and others) to define different contact profiles. The identification of the profiles and classification of respondents according to these profiles were conducted using a two-step cluster analysis algorithm as implemented in SPSS.

Results

We identified seven distinct contact profiles: respondents having (1) contacts predominantly at school, during transportation and leisure time, (2) contacts during leisure time, (3) contacts mainly in the household (large family), (4) contacts at work, (5) contacts solely at school, (6) contacts in other places and finally (7) respondents having a low number of contacts in any setting. Clusters of respondents were found for each profile in each of the countries separately and the fractions of respondents with any given profile were similar across the countries. There was a distinct age-dependence in the distribution of the population across contact profiles.

Conclusions

Clear patterns of how social contacts are distributed among various settings emerge from the analysis with implications for identifying mixing patterns among different population groups. The results will support the analysis of intervention measures for airborne infectious diseases using mathematical modelling.

Estimating age specific transmission rates for infectious diseases: fitting a survey of contact patterns to seroprevalence data for VZV and parvovirus B19 Alessia Melegaro

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Background

The aim of this work is to deepen our understanding of the contribution that different types of contacts may have on the spread of airborne infections and, thus, to improve parameterization of mathematical models.

Method

In this study, the authors estimated the age-specific transmission parameters by using data on social contacts pattern (POLYMOD) as well as seroprevalence data for VZV and B19 for the UK, Finland, Belgium, Poland and Italy. The importance of different types of contacts (i.e. physical/non-physical, long/short, household/school/workplace) was explored and transmission rates were compared for the different European countries.

Results

Four main results were achieved. Firstly, the model fit for both VZV and B19, significantly improved when contact data were stratified in the analysis. Secondly, estimates of the infectivity parameter for VZV were higher than the ones for B19, whatever stratification on contact data was used. Thirdly, skinto-skin (or at least intimate) contact appeared to represent an essential element for disease transmission. Fourth, these general patterns were observed in each of the countries analysed, suggesting that there are consistent biological mechanisms at play.

Conclusions

This study greatly improves our understanding of the spread of these close-contact viruses. Although the viruses differ significantly in their overall infectivity, in both cases intimate contact seems to be particularly important for their spread. This has implications for the modelling of close-contact infectious diseases as these sorts of contacts tend to be more stable and more assortative (like-with-like) than other contacts. In addition, it has implications for the control of infectious diseases such as pandemic influenza via social distance measures.

A comparison of heterogeneity in the acquisition of varicella zoster virus and parvovirus B19 for five different European countries. Niel Hens

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²Health Protection Agency, Centre for Infections, London, United Kingdom Background

For respiratory viruses the force of infection depends on the contact rate and the infectiousness of the pathogen. It has been shown that the contact rate depends on age through heterogeneity in mixing of individuals from different age-classes.

Under the assumptions of lifelong immunity and the epidemic being in a steady state, the force of infection can be estimated from antigen-presence in collected serum samples. For economic reasons, such serum samples are often tested for more than one antigen. These tests results allow for the estimation of unobserved heterogeneity. In a period of 2003-2006 test results on varicella zoster virus and parvovirus B19 were collected from samples in Belgium, England & Wales, Finland, Italy and Poland.

Methods

We model the age-dependent force of infection for varicella zoster virus and parvovirus B19 based on a joint model while incorporating individual unobserved heterogeneity. Individual heterogeneity comprises the differences among individuals' susceptibility to acquire infections, often referred to as 'frailties'. We use a shared gamma frailty to describe this heterogeneity, assuming that the frailty distribution is the same for both infections and contrast this using a correlated frailty approach, relaxing upon this assumption.

Results

The models show a substantial heterogeneity in Poland and England & Wales, while it exists to a lesser extent for Belgium and Italy and is not observed for Finland.

Conclusion

This study shows that in several countries there exists unobserved heterogeneity in the acquisition of airborne infections as varicella zoster virus and parvovirus B19. Further studies are needed to relate this heterogeneity to potential factors, crucial for the mathematical modelling of airborne infections.

3.6. Workshop: Use of alcohol and other drugs in university students

Chairs: Guido Van Hal*, Cécile Boot

Organiser: Guido Van Hal, University of Antwerp, University Scientific Institute for Drug Problems (UWID), Antwerp, Belgium *Contact details: guido.vanhal@skynet.be

From a demographical point of view, university students are expected to be a relatively healthy subset of the general population due to their low age and high level of education. However, compared to their working peers, university students appear to have more health complaints, a lower quality of life and a worse health status. Students may perceive difficulties to adapt to their new environment with new responsibilities, friends, freedom. Substance (ab)use, including alcohol and cannabis, may hinder students to function optimally within the high demands of the university. Students form a distinct group within the public society, which deserves special attention.

The aim of this workshop is to present and discuss the scale of substance abuse by university students in Belgium. In addition, the difference in alcohol and illicit drug use in Swedish medical and business students and Argentinean students will be assessed. Furthermore, associations between substance abuse and health and academic problems in the Netherlands will be discussed. Next, we will focus on the role of misconceptions and beliefs regarding alcohol use, based on a study in UK students.

Cannabis use in university and college students in Antwerp, Belgium: high school? Guido Van Hal

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$^2\text{Association}$ for Alcohol and other Drug problems (VAD), Brussels, Belgium Background

Cannabis is more and more considered the modern cigarette in young people. Unlike the amount of data available on substance use in secondary education, much less is known on this topic where higher education is concerned.

Methods

A structured questionnaire on substance use was spread by intranet in all Antwerp students in Spring 2005. There were 5530 students (25.9%) who returned a correctly completed questionnaire. To get representative results, a random, stratified sample of n = 1501, based on gender, age and college was drawn out of all respondents.

Results

47.4% Of the Antwerp students ever used cannabis; 22.1% are last year users. This is almost twice as high as the last year use of cannabis in the Flemish population of that age. For most cannabis users, this last year use is characterized by periodical fluctuations. During the academic year, 65.6% uses cannabis. During the holiday periods, this rate even gets higher (88.4%).

In contrast, 65.9% stop their use of cannabis during the examination periods. Moreover, during holidays, the frequency of cannabis use is highest (14.3% daily users vs. 5.5% during examination periods). One out of three last year users, encountered at least one sign of problems due to his cannabis use (using longer than planned, problems with hobbies or social activities, relational problems, health problems,...). The degree of problems is directly linked with the frequency of use. This might also explain why male students have three times more signs of problems (30.8%) than female students (9.9%). We also see that the younger people start, the higher the risk to become a problem user.

Conclusions

Cannabis use in Antwerp students is quite common. Some small groups are to be followed more closely, for instance daily cannabis users during examination periods (a few 100 students in total). Based on the survey results, a drug policy plan for the Antwerp students is being prepared.

Alcohol use and illicit drug exposure over time among Swedish medical students and comparisons with other student communities Marie Dablin

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Background

Alcohol and substance abuse in student populations are considered as high. Medical students' life-style may have an impact on their future professional behaviour as well as on their own health.

Methods

Self-report data on alcohol (AUDIT) and drug use in student samples were used. Firstly, evaluations of three cohorts of medical students of years 1, 3 and 6 at Karolinska Institutet (N= 342, response rates 73–90%). Secondly, a comparison of the sample above and Argentinean medical students (response rate 77%). Thirdly, a comparative study of 500 medical students and 500 business students in Stockholm, response rate 77%.

Results

Of Swedish medical students, 23% had hazardous use and 28% reported monthly binge-drinking. Harmful use and monthly binge-drinking was more common among men, who also had higher AUDIT means (P<0.01) than women. Levels decreased in the first post graduate year. No associations were found between alcohol use and distress or personality.

Non-use of alcohol was more common while monthly bingedrinking was less among Argentinean students. Swedish medical students drank less alcohol than Swedish business students.