P1-79 ASSOCIATION BETWEEN CHANGES IN ANTHROPOMETRIC MEASURES THROUGH ADOLESCENCE AND CARDIOVASCULAR RISK FACTORS AT 17 YEARS OF AGE

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Objective To study the association of changes in body mass index (BMI) and waist circumference (WC) with cardiovascular risk factors in late adolescence.
Methods As part of a population-based cohort (EPITeen) 1574 adolescents were evaluated when they were 13 y and 17 y. We computed OR and 95% CIs using logistic regression to study the association between changes in BMI z-scores and WC from 13 to 17 years and outcomes at 17 years. The outcomes were define as high systolic blood pressure (SBP) ≥ 130 mm Hg; high diastolic blood pressure (DBP) ≥ 85 mm Hg; low high density lipoprotein cholesterol (HDLc) if first quartile and high: triglycerides, low density lipoprotein cholesterol (LDLc), glucose and insulin if fourth quartile.
Results Comparing with adolescents who remained normal weight in both study waves, those who remained overweight/obese presented higher odds of high SBP [females: OR=3.33 (1.78–6.23); males: OR=3.17 (2.00–5.01)], DBP [females: OR=2.47 (1.00–6.10); males: OR=2.37 (1.17–4.79)], triglycerides [males: OR=3.25 (1.88–5.62)], LDLc [males: OR=3.50 (2.03–6.00)], insulin [females: OR=2.18 (1.26–3.79); males: OR=2.32 (1.34–4.03)] and low HDLc [females: OR=2.21 (1.28–3.80); males: OR=1.94 (1.11–3.41)]. The estimates for those who changed to overweight/obese were similar. Among those who changed to normal weight, we found associations in the opposite direction, although statistical significance was not achieved. Regarding changes in WC and considering the 75th percentile as cut-off, results were similar, however, partly explained by BMI.
Conclusion Remaining or changing to higher anthropometric measures in adolescence period was associated with worse cardiovascular risk profile later in adolescence.

P1-80 DIFFERENT EFFECTS OF BODY MASS INDEX AND PHYSICAL ACTIVITY ON THE RISK OF ANKLE, WRIST AND HIP FRACTURES IN POSTMENOPAUSAL WOMEN

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Introduction We compared the relationship between body mass index (BMI) and physical activity for the risk of ankle, wrist and hip fractures in a large prospective study of postmenopausal women in the UK.
Methods In 1996–2001, women recruited into the Million Women Study completed a self-administered questionnaire asking about a range of health and lifestyle factors. Incident fractures were identified through self-report in a follow-up questionnaire completed on average 3.2 years after recruitment. RRs and CIs for each fracture site in women by BMI and physical activity at recruitment were calculated using Cox regression models, adjusted for socioeconomic status, and other factors.
Results Among 599 648 postmenopausal women, there were 5117 ankle fractures, 8564 wrist fractures, and 753 hip fractures. When compared to lean women (BMI<20.0 kg/m^2), obese women (BMI$\geq$30 kg/m^2) had an increased risk of ankle fracture (RR=2.47; 95% CI 2.32 to 2.63), but a decreased risk of wrist fracture (RR=0.69; 95% CI 0.65 to 0.73) and hip fracture (RR=0.29; 95% CI 0.23 to

0.37). Physical activity had little influence on the risk of ankle or wrist fracture, but women who reported partaking in strenuous physical activities were at a lower risk of hip fracture than women who reported being never/rarely active (RR=0.65; 95% CI 0.56 to 0.76).
Conclusion BMI and physical activity have different effects on the incidence of fracture at different sites. While obese women are at increased risk of ankle fracture they are at lower risk of wrist and hip fracture. Physical activity has no marked influence on ankle and wrist fracture but is protective against hip fracture.

P1-81 HIV, HSV-2 AND SYPHILIS AMONG MARRIED COUPLES IN INDIA: PATTERNS OF DISCORDANCE AND CONCORDANCE

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Introduction Differences in sexual networks likely explain the disparity in the scale of HIV epidemics in sub-Saharan Africa and India. HIV and sexually transmitted infection (STI) discordant couple studies provide insights into important aspects of these sexual networks. We wished to quantify the role of male sexual behaviour in HIV transmission in married couples.
Methods We analysed patterns of HIV, HSV-2 and syphilis sero-concordance and discordance in married couples from two community surveys in India: the National Family Health Study-3 for HIV-1 (a nationally representative household survey) and the Centre for Global Health Research health check-up for HSV-2 and syphilis. A statistical model was used to estimate the fraction of infections introduced by each of the two partners accounting for higher mortality and separation among HIV concordant couples.
Results Only 0.8%, 16.0% and 3.5% of couples were infected with HIV-1, HSV-2, and syphilis, respectively. A large proportion of infected couples were discordant (73.1%, 55.0% and 84.2% for HIV-1, HSV-2, and syphilis, respectively). Among couples with any STI, the male partner introduced the infection the majority of the time (HIV-1: 85%, HSV-2: 62%, syphilis: 75%).
Conclusions Male infidelity appears to be the driving force of the HIV/STI epidemic our study population and likely in the Indian population at large. Ensuring safe male client and female sex worker contacts should remain a primary target of the National AIDS Control Program in India.

P1-82 PREVALENCE AND CORRELATES OF HERPES SIMPLEX VIRUS-2 AND SYPHILIS INFECTIONS IN THE GENERAL POPULATION IN INDIA

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Introduction To determine the prevalence and correlates of Herpes Simplex Virus-2 (HSV-2) and syphilis infections in the general population in India.

Methods 2456 adults were surveyed in Hyderabad, Bangalore and Chandigarh in India. Socio-demographic and lifestyle characteristics were obtained through a questionnaire, and a dried blood spot (DBS) was collected from all individuals aged 18 and over; sexual behaviour was collected from those aged 18e49 years. DBS samples were tested for HSV-2 and syphilis serology. The association between HSV-2 and syphilis infections with socio-demographic and behavioural variables was analysed using multivariable logistic regression.

Results The prevalence of HSV-2 and syphilis was 10.1% and 1.7%, respectively. Urban/rural differences in prevalence were only seen for syphilis. For both infections, the prevalence between males and females was not significantly different. In males and females, HSV-2 prevalence increased significantly with increasing age; for syphilis, a slight trend was seen only in females. In a multivariable analysis, HSV-2 infection in males and females was associated with site, religion and testing positive for syphilis, in addition to reporting $2 lifetime partners in the previous year among males and being ever married or having had sex with a non-regular partner in the last year among females.

Conclusions The burden and geographic heterogeneity of HSV-2 and syphilis infections in India are significant. A national household and DBS-based sexually transmitted infection (STI) surveillance system would enable monitoring, especially in relation to the HIV epidemic, and planning of evidence-based prevention and treatment programmes.

P1-83 | **PHYSICAL ACTIVITY AND THE POTENTIAL INDEPENDENT DETRIMENTAL MENTAL HEALTH OUTCOMES OF SEDENTARY BEHAVIOUR IN THE GENERAL POPULATION**

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Introduction Sedentary behaviour (SB) is a distinctive form of human behaviour that should not be considered the endpoint of the physical activity (PA) continuum. Hence, SB and PA might work independently in relation with mental health (MH). Investigating these relationships may inform public health initiatives targeting MH promotion.

Methods 6720 adults aged 24–65 years from the Belgian National Health Survey provided data on SB and PA via the IPAQ, and on MH via the GHQ12 and the SCL-90-R. Multiple logistic regression analyses examined associations between SB and five MH problems, controlling for PA and other confounders. Further analyses explored variations across gender, age, SES, and participation in recommended moderate- and vigorous-intensity PA.

Results In the total sample, SB was positively associated with feelings of depression OR=1.406, 95% CI [1.157 to 1.709], anxiety OR=1.523, 95% CI [1.217 to 1.905], and symptoms of somatisation OR=1.401, 95% CI [1.134 to 1.732]. These MH problems were significantly more present among individuals who sat over 2100 min/week (controlled for PA), indicating potential independent detrimental MH outcomes of SB. Further, these positive associations existed independent from gender and age, in the lower SES category, and among all individuals who did not fulfil one PA recommendation. Fulfilment of either one PA recommendation, and high SES seemed protective, with the potential MH protective effects of recommended PA approaching the MH protective effects attributed to high SES.

Conclusion While it is important to encourage both increases in PA and reductions in SB, from the perspective of MH, increasing PA may represent the priority, since PA seems protective against the independent detrimental MH outcomes of SB.

P1-84 | **HIDDEN MARKOV RANDOM FIELD FOR SPATIAL AND SPATIAL-TEMPORAL RISK MAPPING**

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Risk mapping in epidemiology enables the epidemiologist to identify regions with high or low risk of contamination and understand the underlying mechanisms of the spread of the disease. In this work we are presenting a method of risk mapping based on finite mixture models, in which the allocation to the mixture components is modelled through a correlated process, the Potts model. The inference is performed using an approximation of the Expectation Maximisation (EM) algorithm based on the mean-field theory. One advantage of this model is that the classification of the risk is done automatically and not performed in a second step as in current risk mapping.

Methods We are presenting also a way of initialisation able to overcome the sensitivity of this algorithm to its initial parameters. Combining the proposed model to this way of initialisation is leading to good results even in the case of animal non contagious diseases, in which the risk level is very small. This is illustrated in both simulated data and real data: The bovine spongiform Encephalopathy disease in France. We will also introduce an extension of this model to the spatial-temporal context since taking in account the temporal dependencies besides the spatial ones usually provides more useful cues. This methodology will be illustrated on simulated data.

P1-85 | **EPIDEMIOLOGICAL RISK ASSESSMENT OF *C DIFFICILE* OUTBREAKS LEADS TO RAPID IMPLEMENTATION OF A NATIONAL LABORATORY BASED SURVEILLANCE SYSTEM AND CHANGES IN HOSPITALS' HYGIENIC GUIDELINES**

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Introduction In January 2009 the Capital region of Denmark experienced for the first time an outbreak of hypervirulent *Clostridium difficile* PCR ribotype 027.

Methods An epidemiological investigation was launched in a regional hospital in February 2009; the Statens Serum Institut supported the hospital in the outbreak investigation and risk assessment. Considerable media attention raised awareness among other hospitals of the Region and prompted informal collaboration. Risk management was conducted by the National Board of Health, which issued guidelines to enhance surveillance of *C difficile* and to implement control measures.

Results In April 2009, the National Board of Health requested all Clinical Microbiology Departments to submit isolates of *C difficile* to the Reference Laboratory of Statens Serum Institut, if those fulfilled a set of criteria. The criteria ensured surveillance of severe *C difficile* infections by strain characterisation. An epidemiological study on mortality confirmed that the criteria used in the surveillance programme ensured detection of emerging and hyper virulent strains. Following discussion with Hospital Hygienic Committees, in collaboration with the Statens Serum Institut, the National Board of Health, and the Danish Working Environment Authority the recommendations of the Danish Working Environment Authority were changed and disinfection with chlorine became legal and was included as an option in the hospital hygienic guidelines of the Capital Region.

Conclusion The outbreak response including field epidemiology investigation led to rapid changes in national surveillance and policies. Involvement of different stakeholders and communication