1) Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark

**Objectives:** Being unmarried may affect health behaviours, economic resources, and immune response perhaps due to physiological and psychological distress, leading to increased risk of infections. This study examines the association between marital status and risk of hospitalization with pneumonia.

**Methods:** In this large population-based case-control study we identified adult patients with a first-time pneumonia-related hospitalisation between 1994 and 2008, using health care databases in Northern Denmark. For each case, 10 sex- and age-matched population controls were selected from Denmark’s Civil Registration System. We estimated odds ratios (ORs) for pneumonia hospitalisation among persons who were divorced/widowed or never married, as compared to married persons. We used regression analysis to control for a wide range of confounding factors.

**Results:** The study included 67,162 patients with a pneumonia-related hospitalisation and 671,620 population controls. Among pneumonia cases, 47% were married, 40% were divorced/widowed, and 13% had never been married. As compared with married persons, the unadjusted ORs for pneumonia were 1.34 in divorced/widowed individuals and 1.30 in never married persons, respectively. After adjustment for age, gender, 19 different comorbidities, alcoholism, immunosuppressive treatment, urbanization, and living with small children, the adjusted OR for pneumonia-related hospitalisation among patients who were divorced/widowed was 1.20 (95% CI 1.17-1.22), as compared to patients who were presently married. Among never married patients, the adjusted OR was 1.33 (95% CI 1.29-1.37).

**Conclusions:** Married patients have a clearly decreased risk of being hospitalised with pneumonia, possibly related to more social support, healthier lifestyle or higher education.

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**P-235**

**Pulmonary Tuberculosis in Continental Portugal 2000-2010: temporal trends clustering as a tool for control evaluation**

**Topic:** Diseases - Infections

**Presenter: Cristiana Areias**

**Cristiana Areias 1); Carla Nunes 1); Ana Veiga 1); 2) Teodoro Briz 1); 2)**

1) National School of Public Health/University NOVA of Lisbon; 2) Centre of Public Health Studies and Research; 3) Lisbon School of Health Technology/Politechnic Institute of Lisbon

**Background:** Clustering analysis is a useful tool to detect and monitor disease patterns and, consequently, to contribute for an effective population disease management. Portugal has the highest incidence of Tuberculosis in the European Union in 2012, 21.6 cases per 100,000 inhabitants, although it has been decreasing consistently. Two critical PTB (Pulmonary Tuberculosis) areas, metropolitan Oporto and metropolitan Lisbon regions, were previously identified through spatial and space-time clustering for PTB incidence rate and risk factors. Identifying clusters of temporal trends can further elucidate policy makers about municipalities showing a faster or slower TB control improvement.

**Objectives:** To identify clusters of municipalities with high and low temporal trends, in continental Portugal.

**Methods:** Clustering analysis of spatial variation in temporal trends adjusted for sex (2000-2010) for all Portuguese continental municipalities (n = 278) was undertaken using the SaTScan Software. Data were obtained from National Tuberculosis Surveillance System (number of cases of PTB) and from Statistics Portugal (estimated population). Results were interpreted considering critical areas previously identified.

**Results:** A global annual decrease of 5.8% PTB cases was observed. Two clusters of municipalities with increasing trends were identified, one (n = 3) including Grândola, Alcacer-do-Sal and Santiago do Cacém, with an annual increase trend of 33.3% (p < 0.001); other (n = 2), including Albufeira-da-Ré and Vila Flor, showing an annual increase of 86.9% (p = 0.001).

Four clusters with decreasing trends were identified: a cluster (n = 29) comprising all municipalities of the previously identified metropolitan Oporto critical area, with an annual decrease of 7.6% (p = 0.001); a larger cluster (n = 113), that included three municipalities of metropolitan Lisbon critical area (Lisbon, Odivelas, Almada), presenting an annual decrease of 4.2% (p = 0.001); a cluster with two municipalities previously identified in the critical area of metropolitan Lisbon (Almada, Odivelas) with an annual decrease of 5.6% (p = 0.01); and finally a larger cluster (n = 9), comprising Algarve region with an annual decrease of 0.8% (p = 0.012).

**Conclusions:** Although a global decreasing trend was identified, clusters for both increasing and decreasing trends were found. Clusters of increasing trends showed much pronounced increases, but none of these municipalities were identified as part of PTB critical areas previously identified, and should be cautiously interpreted considering the low magnitude of the number of PTB cases. All municipalities previously identified as part of PTB critical areas were included in clusters with decreasing trends sharper than the national one, with the exception of Lisbon, Odivelas and Almada. Algarve region cluster showed a very slow decreasing trend. These results may be explained by differences in trends of PTB risk factors and/or the impact of health policies management.

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**P-236**

**Introduction of pneumococcal vaccine in children aged 0-5 years in Mangistau, Kazakhstan in 2010-2012**

**Topic:** Diseases - Infections

**Presenter: Indira Karibayeva**

**Indira Karibayeva 1); Aikan Akunov 1); Rune Andersson 2); Saken Amireev 1); Andrei Gribkovski 3), 4)**

1) School of Public health, Kazakhstan National Medical University named after S.D. Asfendiyarov, Almaty, Kazakhstan; 2) Institute of Biomedicine, Sahlgrenska Academy at Gothenburg University, Gothenburg, Sweden; 3) Department of International Public Health, Norwegian Institute of Public Health, Oslo, Norway; 4) International School of Public Health, Northern State Medical University, Arkhangelsk, Russia

**Background:** Respiratory diseases among children in Kazakhstan, and pneumonia in particular, are among the leading causes of death in children under 5 years. Altogether, there were 33,774 cases of pneumonia in children under 5 years in Kazakhstan in 2008 alone. Total number of deaths in children under 5 years in 2008 was 2,225 with 1.5 thousand deaths from pneumonia. In 2010, Kazakhstan initiated a vaccination programme for pneumococcal diseases in two of the 14 regions: East Kazakhstan and Mangistau, but the effectiveness of the vaccination has not been studied.

**Objective:** To assess the effectiveness of the vaccination for pneumococcal diseases in the Mangistau region, Kazakhstan.

**Methods:** The data was collected from medical cards of children under 5 years hospitalized in Regional Hospital for Infectious Diseases in the Mangistau region with diagnosis pneumonia from 2010 to 2012 years.

**Results:** Pneumococcal vaccine is given to children at ages 2, 4, and 12-15 months. Comparative analysis of the morbidity among
vaccinated children showed that the overwhelming majority of the children hospitalized for pneumonia were not vaccinated. Altogether, 10411 children (65.3 %) in the Mangistau region were vaccinated in 2010–2012. At the moment, we can judge the epidemiological effectiveness of the vaccine in reducing the incidence of pneumonia. According to official data from the ‘Health of the population of the Republic of Kazakhstan and activity of the organizations of Health care in 2011’ for 2010–2011 years incidence pneumonia of children under 5 years decreased by 20 %—from 12.3 in 2010 to 9.9 in 2011 on 1000 children of this age.

Conclusion: These preliminary results suggest that most of the cases of pneumonia in 2010–2012 among children in the age-group 0–5 years occurred among non-vaccinated children. Moreover, we observed a reduction on the incidence of pneumonia by 20 % during the first year of implementation of pneumococcal vaccine. Further studies are warranted to study the effectiveness of vaccination of children in Kazakhstan.

P-237

Was it possible to anticipate the intensity of the Madeira’s dengue epidemic for the year 2013?

Topic: Diseases - Infections
Presenter: Andréia Costa

Andréia Costa 1); Matilde Rosa 1); Paulo Nogueira 1)

1) Directorate General for Health

As dengue viruses infect millions of people each year, this disease is considered to be one of the most important infectious diseases in many tropical and subtropical countries. Studies indicate that about 40 % of the world’s population lives in countries at risk of dengue infection [1]. Although cyclic, incidences of this disease are increasing and spreading geographically [2]. The dengue virus has been detrimental for the inhabitants of many tropical areas, infecting millions of people worldwide. The dengue epidemic in the Autonomous Region of Madeira, a Portuguese archipelago, was officially declared by the Portuguese Health authorities on October 3rd, 2012.

The goals of this study were: (1) to better understand the evolution of the dengue fever in Madeira and (2) to anticipate its trend/intensity for the year of 2013. This study was challenged by the existence of past information because Madeira is experiencing its first dengue epidemic. Thus, past information regarding outbreaks in other countries was obtained to better understand the behavior of the dengue fever itself. Collection criteria were: outbreak information available (year, serotype, duration, frequency, cases, attack rate, urban attack rate); and information related to infant mortality rate, urban population percentage and population density indicators.

Therefore, 6 regions of the globe were chosen according to the defined criteria aiming at obtaining similar conditions to Madeira in what would concern the dengue spread like climate, temperature and rainy season.

The 6 countries selected were: Cuba, The Bahamas, Guadeloupe, Vietnam (in particular South Vietnam), Australia (in particular Queensland) and Puerto Rico. They all have tropical or sub-tropical climates and their minimum and maximum temperatures do not exceed the interval from 15 to 24 °C.

The dengue attack rates in Madeira were expected to be approximately from 0.8 to 1.3 % (relative to urban population), for clinical cases, and from around 0.4 % (relative to urban population) to 0.7 %, for confirmed cases. Applying this interval attack rate to the population of 0.27 million living in Madeira Island, and taking into account that 0.19 million is urban population, after studying dengue fever trends in these selected countries in previous decades, it was concluded that, this year (2013), between 2160 and 2470 dengue clinical cases can be expected in Madeira. Up until February 3rd, 2013 there were 2164 diagnosed cases.

This analysis is subjective because information about the dengue trend in other countries is being used to anticipate the trend/intensity in Madeira. Each country reacts to an outbreak in a different way. However, taking into account that the goal of this study was not to have exact numbers for this year for dengue cases (2013), but to find some boundaries for them this study fulfills it and feels adequate. In fact, the prediction of the exact number of cases is really improbable; the presentation of a sound estimate is the most useful tool for the Portuguese health institutions’ planning and action.

P-238

Infectious diseases mortality among migrants and host population in five European countries

Topic: Diseases - Infections
Presenter: Rafael Mikolajczyk

Rafael Mikolajczyk 1); Stefanie Helmer 2); Tanja Würmann 3); Raj Bhopal 4); Grégorie Rey 5); Knud Juel 6); Enrique Regidor 7); Patrick Deboosere 8); Johan Mackenbach 9); Anton Kunst 10)

1) Department of Epidemiology, Helmholtz Centre for Infection Research, Braunschweig, Germany; 2) Leibniz Institute for Prevention Research and Epidemiology; 3) School of Public Health, Bielefeld University; 4) Edinburgh Ethnicity and Health Research Group, Centre for Population Health Sciences, University of Edinburgh, UK; 5) INSERM, CapiDeP, Paris, France; 6) National Institute of Public Health, University of Southern Denmark, Copenhagen, Denmark; 7) Department of Preventive Medicine and Public Health School of Medicine University Complutense de Madrid Ciudad Universitaria 28040 Madrid, Spain; 8) Department of Social Research, Vrije Universiteit, Brussels, Brussels, Belgium; 9) Department of Public Health, Erasmus Medical Center, Rotterdam, Netherlands; 10) Department of Public Health, Academic Medical Center (AMC), University of Amsterdam, Amsterdam, Netherlands

Background: Infectious diseases mortality might differ between migrants and the host population, due to for example a higher prevalence in countries of origin or unequal access to medical care in the host country. Differences in infectious diseases mortality in the native population across the host countries can further influence mortality of migrants living in different countries. Cross country analysis can reveal whether it matters where migrants migrated to. We aimed to describe variation in infectious diseases mortality among migrant groups in comparison to the native population in five European countries.

Methods: We obtained national death and population data from Denmark, France, the Netherlands, Scotland and Spain. In each of the countries, we identified tuberculosis, HIV and other infections deaths (excluding pneumonia). We applied Poisson regression to calculate mortality rate ratios (MRRs) for native population and migrants by host country and sex, adjusting for age in 5-years age groups from 0 to 80+. Migrants were defined on the basis of country of birth and restricted to those with country of birth outside of Western Europe.

Results: Percentage of migrants (defined as above) among the total population in the study samples varied between 1.7 % in Spain and 8.3 % in the Netherlands. The differences between migrants and host population were largest for tuberculosis (without any sex differences) and HIV (stronger differences among women). For other infectious diseases, MRRs for migrant versus host population varied for males between 0.98 (95 % CI 0.82–1.16) in Spain and 1.2–2.2 in Denmark, France, Scotland and the Netherlands. For females the differences