Jobs at high risk of exposure include construction trade helpers and labourers (290,000 exposures), carpenters (227,000 exposures), and heavy equipment operators (127,000). Quantitative exposure level estimates are available for some carcinogens.

Conclusions Safety in the construction industry has long been the focus of scientific research. Our work shows that workers in this industry are also exposed to a number of known and suspected human carcinogens, with some exposures being very prevalent currently in Canada. Results from our study may be used by occupational exposure and epidemiologic studies to further investigate exposures and occupational cancer in this unique industry.

Session: 19. Life course trajectories

322 UNEMPLOYMENT AT A YOUNG AGE AND LATER UNEMPLOYMENT IN NATIVE SWEDISH AND IMMIGRANT YOUNG ADULTS

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Objectives The youth unemployment rate is increasing around the world due to recent recessions in the worldwide economy. Unemployment has been seen to affect future work participation. This register-based study examined the long-term effect of unemployment on future unemployment in Sweden.

Methods The study group of 199,623 individuals included all immigrants born between 1968 and 1972 who immigrated to Sweden before 1990 (25,607) and a random sample of native Swedes of the same age (174,016). The follow-up period was 15 years, from 1993 to 2007.

Results Individuals who were unemployed in 1992 had an elevated risk of ≥ 100 days of unemployment during the whole follow-up period. The risk of unemployment in the follow-up increased with the length of unemployment in 1992. Immigrants had a higher risk of unemployment both at baseline and follow-up compared with native Swedes, but followed the same pattern as native Swedes when exposed to unemployment. For individuals with ≥ 100 days of unemployment in 1992, participation in an Active Labour Market Programme (ALMP) increased the risk of future unemployment, whereas both higher educational level at baseline and attainment of a higher educational level between 1992 and 1997 decreased the risk of future unemployment.

Conclusion Exposure to unemployment was associated with elevated risk of future unemployment 15 years after exposure. In addition to the human suffering caused, this can mean substantial costs in the form of increased welfare payments and loss of productivity and tax income to a society. ALMPs seem ineffective in promoting future work participation.

323 SELF-RATED HEALTH BEFORE AND AFTER EMPLOYMENT TRANSITIONS: EVIDENCE IN EUROPEAN COUNTRIES

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Objectives The aim of this study was to investigate self-rated health before and after labour force exit due to unemployment, economic inactivity or early retirement. A secondary objective

was to investigate health before and after entering paid employment

Methods Trajectories of self-rated health in 520,830 employed and 278,954 non-employed persons were examined from the European Community Household Panel Survey (ECHP) for up to 5 years before and 6 years after labour force exit or re-employment, with yearly measurements from 1994–2001. Data were analysed by use of repeated-measures logistic regression with generalised estimating equations.

Results The likelihood of poor health increased among persons who became unemployed (OR = 1.15, 95% CI 1.04–1.28) or economically inactive (OR = 1.29 95% CI 1.17–1.42). Among persons who left the labour force due to early retirement the likelihood of poor health increased in the years before retirement (OR = 1.10 95% CI 1.07–1.13), whereas this increase was less steep in the years after early retirement. Among unemployed persons who re-entered paid employment the likelihood of poor health decreased (OR = 0.80 95% CI 0.71–0.91).

Conclusions Health is influenced by employment transitions into and out of the labour force. Policies should protect persons who leave the labour force against further deterioration of health. Entering paid employment is an important measure to improve self-rated health among unemployed persons.

324 LABOUR MARKET TRAJECTORIES AND PERMANENT DISABILITY. STUDY OF PROGNOSTIC FACTORS

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Objectives In the current context of increasing population ageing and after trends of labour market flexibilisation, this study analyses the impact of labour trajectories on the potential years of working life lost (PYWLL) due to non-work related permanent disability (PD).

Methods Retrospective cohort of 14,999 workers affiliated with the Social Security System in Spain that began a non-work related PD between 2004 and 2010. The PYWLL is defined as the time in years between the age at which a worker initiates a PD and the official retirement age (65 years) or the age of reinstatement to a job. Two indexes of labour trajectory were obtained by Principal Components Analysis: Index 1 (number of contracts, number of unemployment periods and number of periods without affiliation) and Index 2 (percentage of inactive time). Median differences in PYWLL (MD) and 95% confidence intervals (CI95%) were computed using a median regression. The main independent variable was obtained combining tertiles (low, medium, high) of index 1 and 2 ((Index 1, Index 2): (high, high), (high, low), [3DOTS], (low, low)) with category (low, low) as reference. Analysis were stratified by gender and adjusted by the total time elapsed by each worker in the labour trajectory.

Results The median PYWLL was 8.7 for men and 11.0 for women. The greatest crude MD was for category (high, high) for men (MD:4.70, CI95%:3.88, 5.52) and (medium, high) for women (MD:4.09, CI95%:2.93, 5.25). The greatest adjusted difference in medians was for category (high, high) in men (MD:3.05, CI95%:2.64, 3.47) and in women (MD:3.68, CI95%:2.57, 4.68).

Conclusion Workers with a labour trajectory corresponding to the highest indexes have the greatest loss of PYWLL due to non-work related PD. Greater labour market flexibilisation could

mean a major loss of working years and therefore an advancement of age of disability in the coming years.

325 5-YEAR TRAJECTORIES OF EMPLOYMENT IN PEOPLE WITH SPINAL CORD INJURY

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Objectives To identify the employment rate over time, to examine employment trajectories and to determine the predictors of distinct employment trajectories in a cohort of people with spinal cord injury (SCI) in The Netherlands.

Methods The study population consisted of 179 participants from eight rehabilitation centres who had acute SCI, were 18–65 years old, wheelchair dependent, and able to understand Dutch. At the start of rehabilitation, socio-demographics (age, gender, education), pre-injury occupation (level and physical intensity), injury-related factors (age at onset, neurological level and motor completeness), and functional status were measured. Employment status was defined as “≥1 hour of paid work/week”. Follow-up measurements were conducted 1, 2 and 5 years after discharge. Employment trajectories were modelled with longitudinal latent class analysis. Determinants of distinct trajectories were identified using multivariable logistic regressions.

Results The employment rate was 79.5% before injury, 28.2% 1 year, 35.1% 2 year and 44.8% 5 year after discharge. Three distinct employment trajectories were identified: 1) never-worked (N = 35; 20%), those who did not work pre- and post-injury, 2) slow return to work (RTW) (N = 56; 30.9%), those who worked pre-injury and had a slow RTW, and 3) fast RTW (N = 88; 49.1%), those who worked pre-injury and had a fast and sustained RTW. Compared to participants with slow RTW, those with fast RTW had a higher functional status (OR = 1.07, 95% CI = 1.02–1.12) and a pre-injury occupation with low physical intensity (OR = 9.83, 95% CI = 2.27–42.57). The model explained 43% of the variance in RTW trajectory.

Conclusion The employment rate increased over time after discharge. Three distinct employment trajectories were identified. Predictors of fast RTW were higher functional status and pre-injury occupation with low physical intensity. Future research should focus on identifying environmental factors that may contribute to a favourable RTW trajectory.

326 SOCIAL POSITION AND INTELLIGENCE: WHICH IS THE MORE IMPORTANT DETERMINANT OF SICKNESS ABSENCE IN A LIFE-COURSE PERSPECTIVE?

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Objectives Socio-economic position (SEP) and intelligence (IQ) are both predictors of later health, however, the relationships between them have been much debated. Our objective was to examine the separate effects of IQ and SEP on health, as measured by sickness absence (SA).

Methods All live-born males in Norway 1967–1971 (N = 170 678) were followed up in several national registers. Our study

included subjects who were healthy at age 18–19 years, and at risk of SA at start of follow-up (N = 99 738). Health outcome was the 4-year risk (2000–2003) of at least one SA episode. IQ test scores were recorded at military conscription (age 18–19 years). Education level at age 28 and income in 2000 served as indicators of adult SEP, whereas parental education level and income during childhood were indicators of childhood SEP. Risk ratios (RRs) adjusted for birth year were estimated using generalised linear models. Direct and total effects were calculated according to our model.

Results A total of 23 506 subjects (24%) had SA episodes during follow-up. There were strong gradients according to participants' IQ, educational attainment, and income. RRs between the lowest and highest of 5 categories were 5.99, 9.05, and 3.36, respectively. The effects were somewhat weakened when adjusted for childhood SEP, and were further reduced when IQ, education and income were all included in the analysis, to calculate the direct effects (RRs 1.84, 4.79, and 1.65, respectively). According to our model, the total effect of IQ (adjusted for childhood SEP), was RR 4.15.

Conclusions These results suggest that education had a stronger direct effect on health than IQ and income. However, the total effect of IQ was of similar strength and was in part mediated through adult SEP.

327 A COMPARTMENTAL HIDDEN MARKOV MODEL FOR THE LONGITUDINAL ANALYSIS OF THE RISK OF SMOKING-INDUCED LUNG CANCER

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To account for the dynamic aspects of carcinogenesis, we propose a compartmental hidden Markov model in which individuals are either healthy, asymptotically affected, diagnosed, or deceased. Our model is illustrated using the example of smoking-induced lung cancer.

The model was fitted on a case control study nested in the European Prospective Investigation into Cancer and Nutrition study including 757 incident cases and 1524 matched controls. Model estimation was done through a Markov Chain Monte Carlo algorithm, and predictive abilities of the model were assessed through a simulation study based on the posterior estimates of the model parameters. We considered a logistic function for the risk of entering carcinogenesis. Sensitivity analyses to assess the role of each of model parameters was performed by comparing sub-models on the basis of their (simulated) predictive performances.

We found that once adjusted on its impact on exposure duration, age does not independently drive the risk of lung carcinogenesis, while age at starting smoking in ever smokers, and time since cessation in former smokers were found influential. We estimated the time between onset of malignancy and clinical diagnosis to range from 2 to 4 years. Our approach yielded good performances in reconstructing individual trajectories in both cases (sensitivity >90%) and controls (sensitivity >80%). Results also showed that our data did not support an age-dependent time to diagnosis.

The flexible and general formulation of our compartmental model enables the future incorporation of disease states