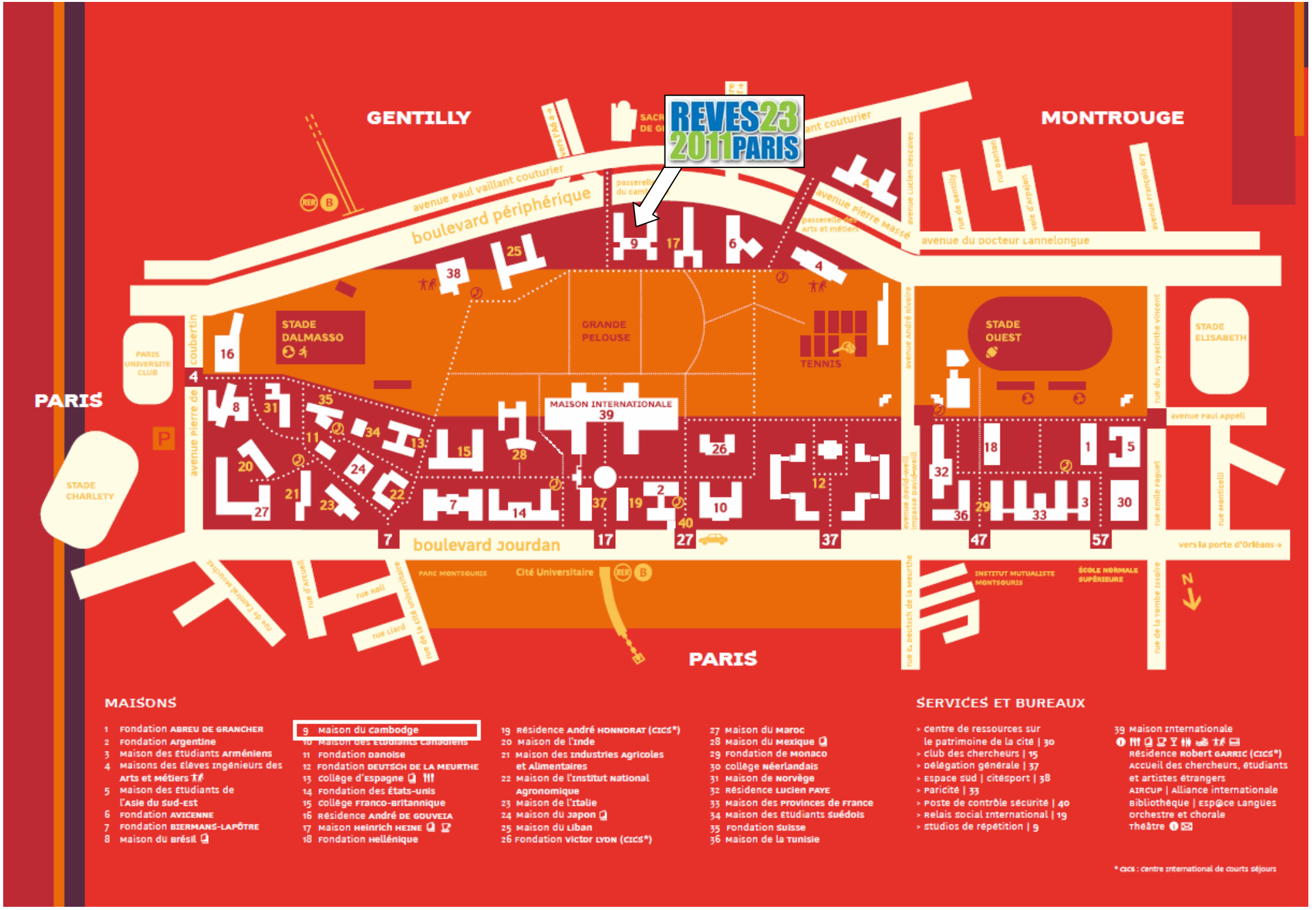
Conference book///



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2 Fondation Argentine
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4 Maisons des Élèves Ingénieurs des Arts et Métiers
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Résidence Robert Garric (CICS*)
Accueil des chercheurs, étudiants et artistes étrangers
AIRCUP | Alliance internationale
Bibliothèque | Esp@ce Langues
orchestre et chorale
Théâtre

* CICS : centre international de courts séjours

REVES 23d Practical issues

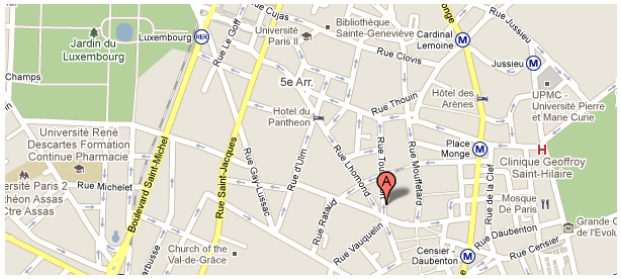
Conference Venue

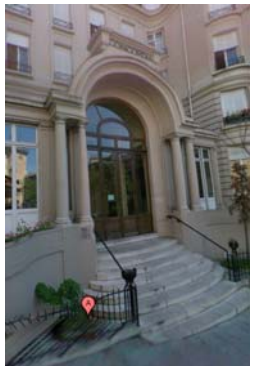
Cité Universitaire Internationale
19 Boulevard Jourdan, 75014 Paris
RER B : Cité Universitaire
Métro line 4 - Porte d'Orléans
Tramway T3
Bus 21, 88, 67

For more information about the location and premises of the meeting venue, please type in Google map: Cité universitaire internationale de Paris.The Cité universitaire internationale is located in a park where there are several buildings. The meeting will take place in the "Salon Cambodge" which is a separate buildingfrom the main one and entrance. Directions will be placed along the way from the entrance to the meeting room. The lunches and the cocktail will take place in the main building.

Conference Diner

Résidence Concordia,
41 rue de Tournefort, 75005 Paris (Métro : Censier ou Place Monge)





Thursday 26th may 8pm on site,

or 7pm at the entrance of the conference venue (Cité internationale universitaire) to join a "mini-tour", getting there by RER and a short walk across the "Quartier Latin" (Jardin du Luxembourg, le Panthéon, la Sorbonne etc)

Transportation inside Paris

Metro

The Parisian metro (RATP) is one of the fastest and most efficient in the world. It's cheap and easy to use. You can buy of pack of ten tickets, buy a Mobilis card, or a "Paris Visite" card for unlimited travel on metro and bus lines for a specified number of days.

Bus

The majority of French cities and towns have a bus network. Tickets can be bought individually, but if you plan to be taking the bus regularly, it's preferable to get a bus card

Cycling

Exploring the city on a bike brings with it a sense of freedom. You can go wherever you choose and park where you like...

Boat

Discovering Paris by taking a boat along the Seine is not only very romantic, but it also offers a particularly interesting and pleasant view of the historic monuments and bridges.

Roller skating

To help you get started, the canal bank pathways are open to pedestrians, cyclists and skaters 09.00 – 17.00 Sundays from March to November, and constitute a pleasant route.

Taxi

If you're planning to take a taxi when you arrive at the airport, you should look around for the sales desk of a taxi company. However, taxis have long been very expensive in Paris. If you're travelling during the day and you're not in a hurry, it's preferable to walk or take public transport.

Vélib' Bike Rentals

You can rent a bike at hundreds of stations or "service points" around the city. You'll pay €1 for a day ticket or €5 for a seven-day ticket, which lets you take an unlimited number of 30-minute journeys. Trips longer than 30 minutes incur additional fees.

You can pick up a bike at any Vélib' station and return it at any other.

REVES 23d "Are sex differences in health expectancy a social issue?"

Maison internationale

The 23d REVES meeting is held in Paris at the "Cité Universitaire Internationale" from May 25 to 27th. It proposes oral and poster presentations dealing with health expectancies and the disablement process (such as general views on health expectancies, measuring disability, classification systems, estimation methods, statistical considerations, available softwares). However REVES meeting also aims at highlighting special topics with the objective of presenting new results and methods on policy relevant questions. The REVES 23d is intended to specifically explore the gender issues in health expectancies.

"Are sex differences in health expectancy a social issue?" For the last ten years social epidemiology has shown that physical and mental health builds up and can evolve positively or negatively along life trajectories. Living conditions (as early as childhood), behaviours and exposures in living and working environments, social support and life events influence positive/negative health conditions which are very differentiated by sex. They also condition the resources which enable one to take care of one's health, and with which one buffers health problems. Under social norms, life trajectories and key events punctuating them have an impact on health. They are not conceived, perceived or lived identically by men and women. We can therefore consider that gender is explicitly regarded as a social health determinant, suggesting the study of links between women's health and their social role, their position within the family and in the labour market. The caring role "assigned" to women for themselves and their family has been *widely stu*died in social sciences. These studies have shown how this role, even if it increases women health skills, can generate material, social, physical and mental fragility. In the field of health, researches based on survey data show striking differences between men and women in most health indicators and in the risk of dying. These assessments - reinforced by work in social epidemiology and social sciences - invite us to deepen studies on health differences from a gender perspective. Using this perspective and in order to open new research avenues, we devote part of this meeting to the study of gender effects on healthy life expectancy with the objective of merging researches on the disability process and health expectancies among men and women to increase understanding on the role of sex/gender differences.

The programme of the 3-day REVES meeting is made of 4 thematic sessions each day, with 3 oral presentations each as well as associated posters dealing with: Gender health differences / Health expectancies: trends & causes / Health and disability transitions / Determinants of Longevity / Living with disability Methods.

The George Myers Lecture will be presented by Jennifer Madans. *Associate Director for Science, National Centre for Health Statistics (USA)*. "In Pursuit of Internationally Comparable Measures of Disability: Travelling with the Washington Group". Dr. Madans, graduate of Bard College (B.A.), received her master of science and Ph.D. degrees in sociology at the University of Michigan, and completed a postdoctoral fellowship in the Department of Epidemiology and Public Health at Yale University. She has served as a lecturer in the Division of Biostatistics and Epidemiology, Department of Community and Family Medicine, Georgetown University School of Medicine and in the Department of Demography at Georgetown. She is a Fellow of the American Statistical Association.

Training session. The 23d REVES meeting is proceeded by a training session on "Health expectancy - decomposition techniques: Example of gender differences" held at INED (Paris) on the day before the meeting opening. The training is conducted by Dr Wilma Nusselder.

Sponsorships allowed to invite 3 researchers of the field to participate in the meeting. The statistical department of the ministry of health (DREES/CNSA), the federative research institute on handicap (IFRH) as well as the national institute for demographic studies (INED) have sponsored this meeting.

The conference bags « ESAT Dumonteil »
All activities of the Centre Dumonteil – ESAT Pere Lachaise - are oriented towards the professional development of people with disabilities, allowing their overall development around a single project. The conference bags are their work !

REVES 23d Programme

WEDNESDAY MAY 25th///

8H30 – 9H00 WELCOME AND REGISTRATION

9H00 OPENING SESSION — **Chantal Cases** Director of the French Institute for Demographic Studies (INED) — **CHAIR Jean-Marie-Robine**

MORNING SESSIONS

9h30-11h00 S1. Gender health differences CHAIR Herman Van Oyen

Emmanuelle Cambois, A Sieurin, JM Robine///	To what extent gender specific health and social patterns explain the recent diverging trends in male and female disability-free life expectancy?
Jan-Willem Bruggink///	Gender differences in Dutch health expectancies and the role of socio-economic status
Marc Luy///	Sex differences in health and mortality: obtained results and future aims of the "cloister study"

11h00-11h30 Posters & Coffee

- Roberto Ham-Chande///. Prospective assessment of gender and social differences in health expectancies and social security in a developing country
- Michel Poulain///. Longevity and living arrangement in old ages: is gender a key variable?

11h30-13h00 Health expectancies: trends & causes CHAIR Yasuhiko Saito

Ana Paula Belon, M Guimarães Lima, M Berti de Azevedo Barros///	Trends in healthy life expectancy among elderly in a city of Southeastern Brazil"
Marten Lagergren, M Thorslun, M Parker///	A comparison of Healthy Life Years (HLY) in Sweden 1980 -2006 when using different health indicators
Mike Smith, O Olatunde, C White///	Inequalities in disability-free life expectancy by area deprivation: England, 2001-04 and 2005-08

LUNCH AT UNIVERSITY CANTEEN

AFTERNOON SESSIONS

14h30-16h00 S2. Determinants of Longevity CHAIR François Hermann

Jennifer Ailshire, E Crimmins, H Beltran-Sanchez///	Exceptional Survivors in the Health and Retirement Study: Comparisons of Health, Well Being, and Functioning by Survivorship, Gender, Race/ethnicity, and Education
Leonid Gavrilov, N Gavrilova///	Sex differences in familial transmission of human longevity
Mariana Lopez-Ortega///	Socioeconomic determinants of inequality in health and survival: the Mexican experience

16h00-16h30 Posters & Coffee

- Natalia Gavrilova, L Gavrilov, V Semyonova///. Understanding sex differences in mortality using causes of death information
- Siu Lan Karen Cheung, JM Robine, S Horiuchi///. International trends in the rate of logistic mortality increase
- Anna Oksuzyan, B Jeune, K Juel, JW Vaupel, K Christensen///. Changes in hospitalization, surgical procedures, and survival among the oldest-old. A follow-up study of the entire Danish 1895 and 1905 cohorts from age 85 to 99 years

16h30-18h00 Health and disability transitions CHAIR Viviana E

Majogé Vliet, M Huisman, D Deeg///	Explaining observed period differences in mobility and self-care decline in older adults
M Arezzo, Cristina Giudici, M Sebastiani///	Transition probabilities to chronic illness, dependency and death in Italy : evidence from IT SILC survey
Zachary Zimmer///	Disability Trajectories by Age, Sex, and Education, among Older Adults in Taiwan

18H00 COCKTAIL (on site, in the main building "La maison internationale")

THURSDAY MAY 26th///

MORNING SESSIONS

9h00-10h30 Health expectancies: trends & causes — CHAIR Dorly Deeg

YURUO YAN///	Disparities in Activities of Daily Living Between Elderly Males and Females in China
KHALED QALALWA, M KHAWAJA, H BRØNNUM-HANSEN///	Health expectancy in Palestine 2006
DUSTIN BROWN///	Spousal Education and Morbidity in the United States

10h30-11h00 Posters & Coffee

- JEAN-MARIE ROBINE, EHLEIS core group///. The joint Action : European Health and Life Expectancy Information System (EHLEIS)
- KATHRYN BACKHOLER, H MANNAN, H WALLS, D MAGLIANO, A BEAUCHAMP, C STEVENSON, J SHAW, A PEETERS///. Projected disparities in the prevalence of obesity among Australian adults.
- J LIU, G CHEN, I CHI, J WU, L PEI, X SONG, L ZHANG, L PANG, Y HAN, XIAOYING ZHENG///. Regional variations in and correlates of disability-free life expectancy among older adults in China

11h00-12h30 Gender differences — CHAIR Sandy Reynolds

A KINGSTON, L ROBINSON, J COLLERTON, K DAVIES, J BOND, T KIRKWOOD, C JAGGER///	Gender difference in disease patterns and their impact on disability in the oldest old : results from the Newcastle 85+ Study
SCOTT LYNCH, S BROWN///	The Role of Socioeconomic Status in Producing Sex Differences in Healthy Life Expectancy in the US over the last four decades
HERMAN VAN OYEN, P KOLIP, EHLEIS///	Gender differences in Healthy Life Years within the EU : an exploration of the "health-survival" paradox

LUNCH AT UNIVERSITY CANTEEN

AFTERNOON SESSIONS

13h30-15h00 Health and disability transitions — CHAIR Carol Jagger

LUC BONNEUX///	Forecasting ADL disability in the European Union
JENNIFER KARAS MONTEZ, M HAYWARD///	The Gender Gap in Active Life Expectancy: Does Women's Longer Life in Worse Health Originate in Early Life?
HENRIKE GALENKAMP A BRAAM, M HUISMAN, D DEEG///	Trends in Subjective and Objective Health in Dutch Older Men and Women

15h00-15h30 Posters & Coffee

- KARIN MODIG///. Future disease burden of the ageing population in Sweden
- ALISON VAN RAALTE P MARTIKAINEN, M MYRSKYLÄ///. Trends in life span variation by sex, occupational class and causes of death.

15h30-17h00 Living with disability — CHAIR Henrik Brønnum-Hansen

ARDO VAN DEN HOUT, R MARIONI, F MATTHEWS///	Estimating life expectancies using a multi-state model for stroke with sex and education as risk factors.
HOWARD MELTZER///	Is disability a risk factor for suicide attempts?
HIRAM BELTRAN-SANCHEZ, J AILSHIRE///	Sex Differences in the Risk of Death by Health Status, Physical Functioning, and Health Behaviours

17H00-18H00. GEORGE MYERS LECTURE — CHAIR Eileen Crimmins

JENNIFER MADANS. *Associate Director for Science, National Centre for Health Statistics (USA).*

"In Pursuit of Internationally Comparable Measures of Disability: Travelling with the Washington Group"

20:00 CONFERENCE DINNER Concordia Building, 41 rue de Tournefort, 75005 Paris (see practical issues)

Meeting point at 19:00 at the Conference venue entrance or at 20:00 directly at the Concordia building

FRIDAY MAY 27th///

MORNING SESSIONS

9h00-10h30 Living with disability — CHAIR Mark Hayward

LIDIA LOUKINE, C WATERS, J ELLISON///	Life Expectancy and Health Adjusted Life Expectancy Among Canadians with Hypertension and Diabetes Mellitus
PATRICK DEBOOSERE, H VAN OYEN///	Gender differences in mortality by self-assessed health: a 3 year follow-up study of the Belgian population
VANESSA YOUNG, CHI-TSUN CHIU, Y SAITO///	What is the active life expectancy of elderly Japanese with and without stroke? An application of the SPACE program

10h30-11h00 Posters & Coffee

- ALEXIS MONTAUT, E CAMBOIS///. People with impairments and their general health status: How far could improved health decrease their risk of social disadvantage?
- ZACHARY ZIMMER, D GU///.Life Expectancy in States of Coresidence among Oldest-Old Chinese: An Alternative Application of IMaCh

11h00-12h30 Methods — CHAIR Roberto Ham-Chande

MICHEL GUILLOT, HYUN SIK KIM///	Trends in healthy survival: a cohort approach
BEATRIZ NOVAK, A PALLONI///	Subjective Survival Expectations and Observed Survival: What Makes them Different?
XIAN LIU, C ENGEL///	Predicting Longitudinal Trajectories of Health Probabilities with Random-effects Multinomial Logit Model

LUNCH AT THEATRE BAR

AFTERNOON SESSIONS

14h00-15h30 Health expectancies: trends & causes — CHAIR Karen Cheung

KWOK-HUNG BILLY SHE///	Differences in health status and health expectancies by gender and geographical districts in Hong Kong.
R MARIONI, A VAN DEN HOUT, M VALENZUELA, C BRAYNE, FIONA MATTHEWS///	Education, occupation, and late-life social engagement and their effects on cognitive impaired life expectancy
MICHAEL MCFARLAND, M HAYWARD, D BROWN///	Marital Biography and Health in Older Adulthood : Exploring the "Under the Skin Processes"

15h30-16h00 Posters & Coffee

- FRANÇOIS HERRMANN///. Longevity, intelligence and education
- MIKKEL BAADSGAARD, H BRØNNUM-HANSEN///. Social inequality in life expectancy increases in Denmark.

16h00-17h30 Gender differences — CHAIR Larry Branch

MARTI PARKER///	Gender differences in LE without joint pain at age 65
MADELIN GOMEZ LEON, EM LEÓN DÍAZ///	The sex gap in life expectancy and healthy life expectancy in Cuba
SANDRA REYNOLDS///	Gender Differences in the Impact of Obesity and Physical Activity on Active Life Expectancy

17H30 CLOSING SESSION by Jean-Marie Robine

Emmanuelle Cambois, A Sieurin, JM Robine///

To what extent gender specific health and social patterns explain the recent diverging trends in male and female disability-free life expectancy?

Context. Men and women usually display contrasted figures regarding disability-free life expectancy (DFLE), meanwhile they generally followed similar trends over the two last decades. But the most recent figures for France, based on datasets circa 2008, revealed an unexpected increasing life expectancy with functional limitations and activity restrictions which concerned more women. The evidence of both the regular sex differentials in DFLE but contrasted recent trends encouraged us to further study the gender paradox "women live longer / men are healthier". In this paper, we first present recent trends in DFLE for France, using several dimensions of the disablement process to depict new findings on sex differences. Then we present various studies conducted on French datasets to address the questions raised by this gender paradox: Are women more incline to report health problems than men? Are women's diseases more disabling than men's ones? Do women report early/mild disability? Do they better cope? Do they live longer with disability? Are male and female disability unevenly treated?

Methods. The most recent French health interview survey (run in 2008) was used to estimate new DFLE for men and women in France and assess sex differences. We used three disability dimensions: functional limitations, general activity limitation and personal care activity restrictions. Second, we mobilized all the available datasets for France to provide similar DFLE indicators in previous years and decades and describe pattern and trends. Third, we pooled together different health studies that bring pieces of evidence for men/women differences all along the disablement process to explain the resulting male shorter but healthier life.

Results. In 2008 in France, almost half of the life expectancy at age 50 for men, and 40% for women, are years of good functional health. Women live longer with functional limitations and activity restrictions than men, notably for chore activities (25% of women's LE_{50} vs 13% for men). Differences are large in older ages but also occurred well before age 65. Trends in LE without activity restrictions seem less favourable than in earlier decades, especially in the 50-65 age group, and especially for women. Assembling various studies showed 1) that women might be more incline to screen and report health problem, but this is not true for all the diseases, invalidating the assumption of a systematic reporting "bias". Sex differences are very large for specific disabling diseases (eg. osteoarticular); 2) women report more disability whatever the dimensions and the severity level, but differences vary depending on the type of disability; 3) women use more technical devices, and when they do they are more efficient than for men; 4) women with functional limitations do not have an excess mortality risks while it is the case for men; among those with functional limitations, women are less at risk of further activity restrictions than men before age 70 and equally at risk after this age ; 5) women with activity restrictions benefit less administrative recognition than men but there are more often institutionalized.

Conclusion. The various studies used here provided evidences of sex difference at every stages of the disablement process. Women are more at risk of developing disability due to more frequent disabling diseases, they are more likely to reduce their impact by using technical devises, and they live longer with functional limitation. This can be the results of women role of family care provider. But, women's and men's disabilities are obviously not equally "treated" on a social point of view: women have less recognition and are more often institutionalized. These results encourage us to go a step further in the analyses of sex differences and to build explicative model to identify social factors that might lead to different risks of disabling diseases, functional limitations and social disadvantage.

Jan-Willem Bruggink///

Gender differences in Dutch health expectancies and the role of socio-economic status

Background. The theme of this years REVES meeting is "Are sex differences in health expectancy a social issue?" The presentation will take a look at the gender differences in health expectancy in the Netherlands, taking into account the differences in socio-economic status.

Methods. Using the Sullivan method, four variants of health expectancy have been calculated for the Netherlands. These figures are broken down by age, sex and socio-economic status. Furthermore the figures on life expectancy without physical limitations have been calculated for different levels of severity of the limitations. With regard to the disease free life expectancy we have looked at the individual diseases/disorders underlying this indicator.

Results. In the Netherlands the life expectancy of women is higher than that of men. However, the health expectancy of women is lower or at best equal to that of men. Especially the disease free life expectancy of women is lower than that of men. This can for a big part be explained by the higher age-specific prevalence of diseases, starting from the age of early adulthood. At different ages, different diseases/disorders play a role in the sex differences. The differences between men and women can only for a small part be explained by the gender differences in socio-economic status.

Conclusions. Gender differences in health expectancy in the Netherlands can only for a small part be explained by differences in socio-economic status. Chronic diseases are more prevalent among women in all age groups starting from early adulthood.

Marc Luy///

Sex differences in health and mortality: obtained results and future aims of the "cloister study"

Background. The aim of the presentation is to summarize the findings of the « cloister study » (starting in 1997) and to describe its future objectives which will be based on the ERC Starting Grant project « HEMOX : the male-female health-mortality-paradox ». The basic idea of the cloister study was that a study of nuns and monks permits us to isolate the impact of biological factors on sex differences in mortality and to control for most of the confounding non-biological factors. Until this study it was only clear that both biological factors and non-biological ones contribute to male excess mortality, but it was unclear to what extent the two categories contribute to the overall difference in life expectancy.

Data and Methods. In 1997 I collected data on almost 12,000 nuns and monks from twelve mainly Bavarian monasteries including each member's life dates as well as information about education, family background and missionizing activity. In 2006, the data were updated and the individual files of the three biggest communities were extended to contain information on causes of death. The analyses were based on a series of period life tables for the time between 1890 and 1995 derived by standard demographic methodology and Cox regressions for entry cohorts. Analyses of causes of death were based on direct standardization.

Results and conclusions. The main results of the cloister study showed (i) that biological factors appear to cause a difference of not more than around one year in life expectancy, and that (ii) the huge sex differences in life expectancy in the general population are caused by the high non-biologically caused mortality of men and not—as often believed—by the low mortality of women. Further analyses of causes of death revealed that external cause mortality and the typical « risk structures » of nuns and monks do neither bias the results nor the theoretical background of the cloister study.

Outlook. HEMOX will be based on these results and will try to decisively advance the understanding of the still unexplained male-female health-mortality paradox. The central aim is to demonstrate that the reverse relationship between sex on the one side and health and mortality on the other is not as paradoxical as it seems. Therefore, we will analyze the health-mortality relationship among around 1,500 Catholic nuns and monks from Austria and Germany in comparison to women and men of the general population in a longitudinal setting with a special focus on the old and oldest-old. Interdisciplinary collaborations are very welcome and the REVES meeting would be an ideal platform to establish such collaborations at the very beginning of this project.

Roberto Ham-Chande///

Prospective assessment of gender and social differences in health expectancies and social security in a developing country

From a social perspective with policy design purposes, REVES 23 is proposing to move forward on studying the impact of sex and gender differences upon health expectancies. It is already recognized that there are not only gender differences but plain disadvantages in detriment of health and well-being of elderly women. However, it is not known enough about causes and even less about consequences. In fact it is a broader social issue, since differences and disadvantages are linked to the degree of development, cultural conditions and socio-economic status. Thus to explain differences, diagnose problems, propose solutions, design policies and implement programs, we must consider the social and economic environment which in turn requires interdisciplinary approaches. Under the concept of social protection the female part of an ageing population in developing countries is considered as a vulnerable group. Based on this approach this paper analyzes in a prospective method how gender and socio-economic characteristics affect health expectancies and social security in developing societies. A first assessment of the relevance of the subject is the higher women's survival rates. Just by regular statistics, when it comes to demographic ageing we are mainly referring to the female part of the ageing process. In fact, population projections provide the initial framework in the evaluation of ageing as a public health issue. Demographic projections jointly with health statistics and data from surveys on health and ageing, allow us to assemble epidemiological scenarios correlated to socio-economic variables. It should be stressed that in any prospective study we are not

attempting the impossible job of guessing the future. Rather, the objective is to analyze projection assumptions and their effects as future scenarios. The final target is to enhance health and well-being by guiding short-term planning for administrative purposes and designing long-term policies seeking sustainability. Projections and actuarial evaluations of pensions systems must now consider the shift from a social security of defined benefits to a defined contributions system of individual savings account privately managed. Any prospective suggests the insufficiency of pensions under the new system with considerable disadvantages for women. In terms of socio-economic conditions, elderly women have lower education, their family and social roles were gender hardened, they were less involved in the labor market, with occupations of lesser status and lower income. The number of women who have an old-age pension is very low, most of them are due not for retirement but because of widowhood. Health care also requires actuarial evaluation and financial planning. Women's longer life expectancies and higher prevalence of chronic diseases and disabilities are well known facts. But they have not been addressed sufficiently in prospective terms. Just by assuming the same rates of prevalence of selected chronic diseases and disabilities in projected demographic age and sex structures yields scenarios that bring up several concerns. Health systems will require substantial adaptations, the costs of health care will be huge, family strategies will be challenged. All that is happening in a social and economic environment that lacks resources and foresights to meet any of these and other expected situations. A main topic is the prospective evaluation of health care costs. The results show scenarios indicating that under current conditions the costs will be unaffordable, which is a subject that we cannot afford to ignore.

Michel Poulain///

Longevity and living arrangement in old ages: is gender a key variable?

Background. Numerous research investigations demonstrated the role of marital status and marital history on mortality and we presented in REVES 2010 the results of our investigations on the impact of marital history on extreme longevity. It is considered the de facto living arrangement for older persons has a larger impact on longevity and a special interest is devoted to mortality risks in collective household compared to the one in private household. Also the problem of loneliness in old age is important and comparing the level of mortality of those living alone with those living with others could contribute to the analysis of the determinants of longevity. As the distribution of oldest olds by living arrangement is largely different by gender it is assumed that part of the sex differences could be linked to differences in living arrangement.

Data and methods. Two datasets will be used: (i) the total Belgian population followed during 15 years between 1991 and 2006 and (ii) a specific dataset included the individual trajectory of 3000 Belgian centenarians including information on their marital history as well as living arrangements in old ages. Classical statistical methods will be used as well as survival analysis methods.

Results. This investigation is still ongoing but the first results emphasize the paradox linked to the observation that a larger proportion of oldest olds and more specifically centenarians are living in nursing home while the mortality level is the highest in these collective households compared to private households. However when controlling the health status, it appears from our first analysis that the level of mortality is similar between two main categories of living arrangements. The next step will considered separately in private household those living alone (never married or ever-married), those living in married couples and those living with others (excluding married couples). Special attention will be devoted to analyze gender differences that appear to be important based on first results. Socio-economic characteristics of the oldest olds captured through censuses will also be considered as well in addition to gender to control differences emerging from the analysis

Ana Paula Belon, M Guimarães Lima, M Berti de Azevedo Barros///

Trends in healthy life expectancy among elderly in a city of Southeastern Brazil

Introduction. The life expectancy is growing in Brazil, mainly since the second half of the 20th century. Recently, the elderly has also experienced significant increase in life years. However, this trend probably has not been accompanied by the extension of healthy life.

Objective. The aim of this study was to estimate the trend of healthy life expectancy for persons 60 years of age or older using two measures of state of health, obtained from two health surveys carried out in a city of one million people in Southeastern Brazil in 2001-2002 and in 2008-2009.

Methods. The estimates were calculated using a life table based on the method developed by Sullivan. Mortality data and population estimates for mid-2001 and 2008 were provided by the Municipal Health Department of Campinas. The surveys in Campinas, carried out in 2001-2002 and 2008-2009, were a cross-sectional population-based study, involving 426 and 1519 individuals aged 60 years or more, respectively. The indicators of health state were self-rated health (good/poor) and physical functioning, measured using the SF-36 scale score (good/poor).

Results. The prevalence of poor self-rated health and poor physical functioning increased with age, for both periods. In 2001, the elderly aged 60 could expect to live, on average, 15.8 years, of which 14.1 (89.2%) would be with good self-rated health. Also, at age of 60, it was expected that elderly live, on average, 58.4% of the years with good physical functioning. In 2008, the life expectancy at age 60 increased by 3.4 years, and it was expected that people live around 87.9% and 60,4% of life expectancy in a good state of health and good physical functioning, respectively. Although the increase in life expectancy at age 70 (2.1 years) and 80 (1.2 years) in 2008, the elderly spend fewer years living with poor physical functioning and poor health. At age of 70, the percentage of elderly living with good health increased from 85.6% to 86.9% between 2001 and 2008. Concerning to the good physical functioning, these averages were 44.6% in 2001 and 48.0% in 2008. Of the total number of years to be lived from the age of 80 in 2001, 78.9% would be with good health or 21.0% with good physical functioning. In 2008, these averages were 88.9% for good state of health and 35.4% for good physical functioning.

Conclusions: The findings of this study pointed out that the proportion of healthy years lost reduces with age. However, among young elderly there was a decline of life years to be lived with good health between 2001 and 2008. By contrast, among persons older than 70, it was observed an improvement of indicators of healthy life. Public polices should take into account the different needs of the age groups and provide improved health conditions to elderly population.

Marten Lagergren, M Thorslun, M Parker///

A comparison of Healthy Life Years (HLY) in Sweden 1980 -2006 when using different health indicators

Background. Healthy Life Years (HLY), i. e. the expected length of life in health, is an important indicator of health in a population and has been denoted by the European Commission as the structural indicator of health to be used in comparisons between EU-countries. The calculation of HLY can be made using prevalence of ill-health per age-group according to a representative population study. The result will depend on which indicator of ill-health that is used. The aim of the study was to investigate the variability of HLY from 65 years and older – between indicators and over time - when using different ill-health indicators.

Method. HLY was calculated by the Sullivan method using data from the Swedish Survey of Living Conditions (ULF) collected bi-annually from 1980 - 2006. The following indicators of ill-health were used: ADL-dependency, IADL-dependency, Self-reported overall health, General activity limitations (GALI), Statistic Sweden (SCB) Health Index and Mobility disability.

Results. The calculations showed that HLY from 65 years and older increased rapidly during the time period regardless of choice of indicator with one exception - for women with ill-health defined as ADL-dependency. Most of the years added to life during the last two decades in Sweden were according to the ULF surveys free from ill-health and disability – including expected years of life from age 85. The stability of the time trends varied with indicator. The most stable trends were achieved with the indicator Self-reported ill-health. Also General activity limitations (GALI), the Statistic Sweden (SCB) Health Index and Mobility disability resulted in stable time trends, whereas HLY calculated using ADL- or IADL-dependency showed greater variability from year to year.

Conclusions. The choice of indicator to be used in the HLY-calculations is important in order to achieve correct and stable results for international comparisons. The analysis shows that in Sweden all indicators except ADL-dependency resulted in the same general time trend. Self-reported ill-health showed the most stable development. However, several other indicators showed about the same result - other considerations thus might turn out to be more important when choosing the indicator.

Mike Smith, O Olatunde, C White///

Inequalities in disability-free life expectancy by area deprivation: England, 2001-04 and 2005-08

Background. It is estimated that England could gain almost 3 million person years free from limiting illness or disability if everyone experienced the same rates of death and limiting illness as those living in the most advantaged fifth of small areas. Monitoring the impact of policies designed to reduce health inequalities is problematic however due to the relative paucity of survey data in the years between censuses. Here we present an analysis of disability–free life expectancy (DFLE) based on small areas, ranked according to ecological deprivation, over two separate periods of the first decade of the 21st century.

Methods. ONS General Household Survey (GHS), mortality and population data were combined over the periods 2001–04 and 2005–08. Data for England were ranked according to relative deprivation (Index of Multiple Deprivation, 2007) at the Lower Super Output Area (LSOA) level and divided into fifths. Comparisons were made between the DFLE of males and females at birth and at age 65 by fifth of deprivation and over time.

Results. Males and females in the most deprived fifth of areas were more than 1.5 times more likely to report a limiting longstanding illness than their counterparts in the least deprived areas. At birth the inequality in DFLE between the least and most deprived areas was approximately twice that of life expectancy (LE) and the gap was larger for males than for females. While LE and DFLE generally increased over time, improvements across areas were unequal and for men at age 65 there was a significant increase in health inequality between areas over the period 2001–04 to 2005–08.

Conclusions. In England In 2001–04 and 2005–08 people in less deprived areas could expect longer, healthier lives than their counterparts in more deprived areas. Health inequalities were wider for males than for females and increased significantly for men aged 65 in the first decade of the 21st century. Intercensal analyses of health inequalities across areas of deprivation, based on small area geographies, enable more timely monitoring of the effectiveness of programs and initiatives designed to improve public health outcomes.

Jennifer Ailshire, E Crimmins, H Beltran-Sanchez///

Exceptional Survivors in the Health and Retirement Study: Comparisons of Health, Well Being, and Functioning by Survivorship, Gender, Race/ethnicity, and Education

Background. Reaching advanced old age is becoming an increasingly common experience in the United States and there is growing interest in understanding the health and functioning of individuals who experience exceptional longevity. The current study is the first to use a nationally representative sample of older U.S. adults to examine the health characteristics of exceptional survivors and to assess variation in these characteristics by survivorship, gender, race/ethnicity and education.

Methods. We use data from the ongoing Health and Retirement Study of Asset and Health Dynamics Among the Oldest Old, a national sample of U.S. adults aged 70 years and older at baseline. For the purpose of this study we focus on 1,709 respondents who were born between 1900 and 1911, and the 223 exceptional survivors from this group who reached at least 97 years of age during the study period. Our assessment of the physical, mental, functional and cognitive health of exceptional survivors includes examination of self-reported comorbidities, ADLs, self-rated health, body mass index, smoking status, and mental health, and tests of cognitive function. We assessed differences in health and functioning by survivorship and social characteristics using ANOVA and multiple logistic regression.

Results. Exceptional survivors were healthier at baseline compared to non-survivors, but became less healthy over time. About 10-20% of exceptional survivors remained in good health (i.e. had no comorbidities) and were high functioning (i.e. no physical limitations or cognitive impairment) upon reaching 97 years of age. Women were more likely to reach exceptionally old age, but had more comorbidities, were more likely to have problems with physical functioning and were more likely to have worse cognitive functioning than men; but women had better health behaviors. Blacks tended to have worse physical health and lower cognitive functioning relative to Whites. The results suggest that Hispanics and Whites had similar health characteristics and that Hispanics may have been slightly healthier than Whites. Respondents with higher education had better mental health and cognitive functioning than their less educated counterparts, but higher stroke and cancer prevalence. We found no associations between father's education and physical health and functioning, mental health or health behaviors. However, exceptional survivors who had more educated fathers demonstrated better cognitive functioning.

Conclusion. Exceptional survivors in the U.S. are a heterogeneous group with respect to both social characteristics and health. Although many exceptional survivors are in poor health, some survive to very old age free of chronic diseases and physical and cognitive impairments. Health and functioning also varies by gender, race/ethnicity and education. Future examination of the factors associated with becoming a healthy exceptional survivor can aid our understanding of how some individuals are able to maintain relatively good health and functioning at advanced old ages.

Leonid Gavrilov, N Gavrilova///

Sex differences in familial transmission of human longevity

Background. Numerous studies showed that biological relatives of centenarians have substantial survival advantage compared to relatives of shorter-lived individuals. At the same time little is known about the role of centenarian's sex in these effects. This study explores effects of centenarian sex on survival of their parents and siblings.

Methods. We have developed and analyzed a new computerized database on 1,945 validated centenarians born in 1880-1895 in the the United States, their parents and 13,185 shorter-lived siblings. Student t-test was used to compare mean life spans. Gompertz regression models were used to model survival time between age 50 and death for centenarian siblings. Models for brothers and sisters were analyzed separately.

Results. Brothers of male centenarians lived significantly longer compared to brothers of female centenarians : life expectancy at age 50 was 29.01 and 26.86 respectively (p<0.001). Sisters of male centenarians had no survival advantage compared to sisters of female centenarians (31.26 vs 31.73 years, p=0.24). The sex ratio for siblings surviving to age 50 years is higher (more males) in families with male centenarian (sex ratio = 1.22), when compared to the sex ratio in families with female centenarian (sex ratio = 1.10). In addition to brothers, fathers of male centenarians demonstrate significant survival advantage compared to fathers of female centenarians : life expectancy at age 50 equal to 27.22 vs 25.97 (p=0.04). This effect is sex-specific and is observed for fathers of male centenarians but not for mothers who have similar survival with mothers of female centenarians (28.26 vs 27.28, p=0.14). These effects were confirmed in multivariate model of sibling survival after age 50 when controlling for family size, parental age, parental longevity and centenarian sex. In multivariate models the effect of centenarian's sex was significant only for brothers (male sex of centenarian decreased hazard rate ratio) but not for sisters. Paternal longevity (lifespan over 80) significantly improved survival of brothers but not survival of sisters. Maternal longevity had weaker but statistically significant effect on survival of both brothers and sisters.

Conclusions. Male sex of centenarians had significant effect on survival of male relatives (brothers and fathers) but not on survival of female relatives. These findings are consistent with hypothesis that some longevity genes may be located on male Y-chromosome although social and economic explanations could not be excluded at this stage of the study.

Mariana Lopez-Ortega///

Socioeconomic determinants of inequality in health and survival: the Mexican experience

Background. Research has shown that in spite of the remarkable overall gains in life expectancy and decreased mortality, health inequities have persisted both between and within countries. In many of these, health inequities have not only persisted but widened. Studies have shown how sex is a constant determinant in health inequities, and latter studies have also shown evidence of a high impact of socioeconomic determinants of health and of health inequities. In exploring these inequities, their impact in survival, the risk and incidence of mortality, emerges as a highly relevant issue. In spite of the recent interest in ageing in Mexico and the growth of ageing related research, little is known on mortality risk and survival of the older population and regarding survival analysis, most studies concentrate on survival given specific medical conditions. Until this revision only two studies were found on survival of older population groups (breast cancer and chronic obstructive pulmonary disease), and no published studies were found on total survival of the older population in Mexico. In order to further advance knowledge on the survival of the older population in Mexico, this study analyses the relationship between health, disability, and survival in a representative sample of the population 50 years and older.

Methods. Non-parametric and semi-parametric methods were used to estimate the risk of death in a two year period. First, Kaplan-Meier survival curves and hazard functions were generated to estimate the probability of survival according to different characteristics of the sampled population. In addition, Cox proportional hazards models were estimated first for each covariate separately and in a second stage, multivariate estimations were generated. Estimations were done using complete-case analysis and using the Multiple Imputation by Chained Equations, ICE method in order to generate full information data. Data comes from the Mexican Health and Aging Study, MHAS in its two waves 2001 and 2003. The final working sample consists of 11,680 individuals of which 526 died during the follow-up period. Of those still alive in 2003 54% are female, while within the deceased individuals 48.3% are female.

Results. The Kaplan-Meier curves show important differences between men and women in terms of their probability of survival and by partnership status with men and those with no partner showing the lowest probability of surviving. Regarding age, significant differences only appear for the group 70 years and older compared to younger age groups. Results from the Cox proportional hazards models using each variable separately show how being male, being in the oldest age groups, and having no partner impose a higher mortality hazard (p<=0.001). In addition, compared to those with no formal education, those with formal education present a lower hazard, with this hazard decreasing as formal education increases. As a Frailty Index (following Rockwood et al. 1999) was generated and included as covariate in the analyses, results show that for men as frailty increases the hazard of mortality increases while for females the hazard increases only for those with a very frail status.

Conclusions. This study gives an initial relevant insight into the survival process of the sample group. The main findings show that survival is significantly determined by other factors besides health and age. Mainly, there are significant differences between men and women, between those with and without a partner, and given some socioeconomic factors such as educational attainment. The results of this study going beyond using physical or biomedical domains only to analyse survival shows some light on the importance of social and economic factors in overall health and mortality and should be taken into account in planning of health policies in ageing. Further studies including

other social aspects such as living arrangements, social support and participation, among others would be an interesting next step.

Natalia Gavrilova, L Gavrilov, V Semyonova///

Understanding sex differences in mortality using causes of death information

Background. As life expectancy increased in the 20th century, there was also an increase in the differences between male and female life spans. However, in the recent years an opposite trend is observed: gender gap in life expectancy is decreasing in most developed countries. This trend is particularly evident at older ages. This new trend requires its proper explanation in order to project further trends in male and female mortality. In this study we used mortality data by causes of death to explore the sex differences in mortality and evolution of these differences over time.

Methods. Data on cause-specific mortality for 26 developed countries in the age group 55-64 years are taken from the World Health Organization mortality database. Statistical methods included correlation and regression analyses.

Results. It was found that causes of death differ strongly in the level of interdependence between male and female mortality rates. For example, correlation between male and female mortality from stomach cancer or stroke is very strong (r=0.96 and 0.92) while similar correlation for cancer of the lung or cancer of the oesophagus is low (r=0.43 and 0.21). We call highly correlated (between sexes) causes of death the "sex concordant" causes, meaning that mortality levels for one sex can be reliably estimated from mortality levels of the opposite sex (in contrast to sex discordant causes with low intersex correlation, r<0.5). Other examples of sex concordant causes of death include influenza, cirrhosis of liver, stroke, and pneumonia. These highly correlated causes of death should have few common factors for men and women (simple factor structure), and therefore they could be informative for understanding sex differences in response to the same risk factors. All these causes of death demonstrate higher death rates for males, compared to females. The slope coefficients for the dependence of male mortality rate on female mortality rate is higher than 1.0, indicating that males are more vulnerable to the same risk factors, which affects females. In contrast to the slope parameters, the intercept parameters of the linear dependence are close to zero, indicating that excess male mortality from these causes of death is not caused by male-specific risk factors. At the same time, the contribution of sex discordant causes of death to the observed sex differences in total mortality is relatively small, and does not exceed contribution of sex concordant causes of death.

Conclusions. Male subpopulation turns out to be more sensitive to the action of the same factors which affect the female subpopulation. This phenomenon provides the main contribution to the gender gap in mortality from sex concordant causes, and a significant contribution to the sex differences in total mortality. This observation can be used for predictions of sex differences in human mortality.

Siu Lan Karen Cheung, JM Robine, S Horiuchi///

International trends in the rate of logistic mortality increase

Background. Thatcher et al. (2010) used the simple logistic model with two parameters, which is known to fit data on old-age mortality well (Thatcher 1999), to investigate the old-age mortality compression and estimated the rate of logistic mortality increase, denoted by b, for ages 70-90. They concluded that if logit m(x) tends to fall faster at younger ages, then the slope b of the logit line will become steeper and mortality compression will occur. In this paper, we aim to estimate the rate of logistic mortality increase, denoted by b, for ages 70-90 in 23 countries with good and acceptable quality of data from Human Mortality Database and examine whether there is a universal trend in b.

Methods. We adopt a special case of the logistic model of mortality, which has only two parameters as does the Lexis model, and it is usually written in the form of model (1)

$$\mu(x) = a e^{bx} / (1 + a e^{bx}) \qquad (1)$$

Results. Our results show that the rate of logistic increase has steadily risen for females and males from about 0.10 in the 1950s to about 0.13 in recent years for most established market-economy countries in Europe as shown in group A (19 European countries). Among males, the value of parameter b is about 0.02 smaller than that for females and the rate of logistic mortality increase always lags behind females about 20 years. However, for Japanese females, although the increase was similar to the common pattern from 0.10 in 1947 to 0.13 in 1984, then the value of parameter b reached the highest 0.14 and became levelling off in the decade 1984-1995. Afterwards, it reverted to the level of 1984. In Canada, b increased at a relatively slower pace from 0.10 in 1950 to 0.12 in 2006 among females, whereas in the US the value of b tended to stay at 0.10-0.11 throughout the whole period 1921-2006. In Australia, b for females fluctuated around 0.10-0.11 before 1980, then a noticeable increase was observed from 0.12 in 1980 to 0.14 in 2007.

Conclusions. The results show that the rate of logistic increase has steadily risen for females and males from about 0.10 in the 1950s to about 0.13 in recent years for most

established market-economy countries. Deviant patterns such as slow increase, plateau and decrease are observed for some periods in Australia, Canada, Denmark, Japan and the USA. Possible reasons for those dominant and deviant trends are discussed.

Anna Oksuzyan, B Jeune, K Juel, JW Vaupel, K Christensen///

Changes in hospitalization, surgical procedures, and survival among the oldest-old. A follow-up study of the entire Danish 1895 and 1905 cohorts from age 85 to 99 years

Background. The study aimed to compare the 1895 and 1905 cohort members with respect to hospitalization and surgical procedures from age 85 to 99 years in order to investigate whether more active treatment of elderly people in recent decades may partially explain better survival at old-ages observed within several past decades in Denmark.

Methods. The study was based on a complete follow-up of the Danish 1895 and 1905 cohort members alive and residing in Denmark at age 85 years. The 1895 cohort (n=12,326) was followed from 1980 through 1994 and the 1905 cohort (n=15,477) was followed from 1990 through 2004 with respect to hospitalizations and surgical procedures, as well as with regard to in-hospital and post-operative mortality. Data from the Central Personal Register, Danish Demographic Database, Building and Residence Register, and the Danish National Patient Register were used. Survival status was available though December 2008.

Results. The 1905 cohort members were hospitalized and operated more frequently, but they had shorter length of hospital stay than the 1895 cohort at the same age period from 85 to 99 years. Despite increased hospitalization and operation rates, there was no increase in post-operative and in-hospital mortality in the 1905 cohort. These patterns were similar among men and women. Women born in 1905 had better survival than women born in 1895, but there was no survival progress for men. Although there were more home dwellers in the 1905 cohort than in the 1895 cohort, all patterns remained unaltered when the analysis was restricted to elderly living at home.

Conclusions. The observed patterns reflect more active treatment of the recent cohorts of very old persons and less ageism in the Danish healthcare system. No increase in post-operative mortality suggests that the selection of elderly patients eligible for surgical treatment is likely to be based on biological rather than chronological age. However, with respect to better survival and expansion of lifespan more active hospital treatment of very old people was beneficial for women, whereas there was no survival progress for men. No survival improvements in the 1905 male cohort needs further investigation.

Majogé van Vliet, M Huisman, D Deeg///

Explaining observed period differences in mobility and self-care decline in older adults.

Background. Many people face decline in mobility and self-care when growing older. The question is to what extent this decline in mobility and self-care with age has increased or decreased throughout recent time periods.

Methods. A prospective cohort study was done, using data from the Longitudinal Aging Study Amsterdam (LASA). LASA focuses on physical, cognitive, emotional and social functioning of older adults. Mobility was assessed with the questions: "Can you climb up and down stairs?" "Can you walk outside for five minutes without stopping?" and "Can you use own or public transport?". Self-care was assessed with the questions: "Can you dress and undress yourself?" "Can you cut your own toenails?" and "Can you rise from a chair and sit down again?". Each question had five answering categories from 1) yes, without difficulty, to 5) no, I cannot. Relevant change in mobility and self-care, using the Edwards-Nunnally correction, was determined with chi-square tests within two periods of time, 1995-1998 (Period 1) and 2001-2005 (Period 2) for younger old adults (76 - 82 years of age) and older old adults (82 - 88 years of age). To adjust for confounding and taking death during follow-up into account, multinomial regression analysis were carried out with Period as primary determinant and mobility and self-care as outcome variables with stable, declined and died during follow-up as outcome categories.

Results. Younger old adults (N=838) declined more often in mobility in Period 2 compared to Period 1 (Chi^2=7.0; df=2; p=.030). No Period difference was found for younger olds in self-care (Chi^2=4.5; df=2; p=.104). Older old adults (N=744) declined in Period 2 more often in mobility (Chi^2=6.5; df=2; p=.039) and in self-care (Chi^2=14.1; df=2; p=.001) compared to Period 1. After adjusting for relevant confounders (time to follow-up, sex, education and persistent cognitive decline), younger old adults were protected against mobility decline (b= -.952; p=.035; OR= 0.4) and decline in self-care (b= -1.674; p=.002; OR=0.2) in Period 2 compared to Period 1; older old adults were as well protected against mobility (b= - 0.370; p=.405; OR=0.7) and self-care (b= -0.678; p=.195; OR=0.5) decline in Period 2 compared to Period 1, but not significant.

Conclusions. The observed more frequent decline in mobility in the more recent period 2 does not last when adjusted for time to follow-up and baseline characteristics, taking death during follow-up into account.

M Arezzo, Cristina Giudici, M Sebastiani///

Transition probabilities to chronic illness, dependency and death in Italy : evidence from IT SILC survey

The increasing of retirement age in order to maintain an active population able to compensate for the growth in the number of pensioners is a central issue in the European debate. Central to the discussion surrounding the extension of the active lifespan is the state of health of the elderly : on one hand the health condition of the population is clearly crucial to all hypotheses linked to the extension of active life, on the other hand, European governments are specifically interested in forecasting the health care needs and services which will be required by the elderly.

The calculation of health expectancy in Italy is generally based on the so-called Sullivan method, while the availability of the longitudinal module of the European survey on income and living condition, and the reliability of the Minimum European Health Module, allows to measure health expectancy in Italy on the basis of incidences.

The aim of this study is to estimate the health transition probabilities for Italian elderly and to study how they are influenced by socio-relational variables, in order to calculate differences in health expectancy linked to socio-relational factors.

The analysis is carried out using the Italian longitudinal module of the European survey on income and living condition: it silc 2004-2007; the study is limited to the population aged 55 and over in 2004 (4645 interviews) living in private households. Transition probabilities between chronic illness, disability and death are estimated using several methodologies. In particular, using a Markov model, we evaluate the impact of individual characteristics, as well as social and environmental variables, on health transition, controlling for initial condition and sample attrition.

Health is measured through the Minimum European Health Module, consisting of 3 global questions concerning 3 health domains: self-perceived health, chronic conditions and long-term activity limitation. Health expectancy is calculated using the software IMaCh, referring to the 3 health definitions.

On one hand the study shows important differences among gender and geographical areas, and highlight certain aspects of the phenomenon that merit further investigation; on the other hand it emphasize the importance of the social and relational context in worsening the health status within the Italian society.

Zachary Zimmer///

Disability Trajectories by Age, Sex, and Education, among Older Adults in Taiwan

Background. Past research has indicated that the progression of disability fluctuates across states as people age, but older people do not all follow similar paths (Crimmins and Saito 1993). Some remain disability-free until the day they die, while others experience onset followed by recovery, or continued deterioration until death. These divergent patterns in disability also vary across characteristics that are known to influence health outcomes, such as sex and education. Taiwan has one of the most rapidly aging populations in the world, and with the increase in the number and percentage of people in old age comes increasing concern about the potential burden of disability within society. However, no research from Taiwan has examined the types of disability patterns by age that is experienced by older Taiwanese or how these are influenced by social and demographic covariates.

Method. The current paper follows an earlier one presented at REVES 2009 and currently in press (Zimmer et al., forthcoming) that employed a new approach for estimating disability burden among oldest-old Chinese (age 80+) based on group-based trajectories and joint modeling of mortality probabilities using finite mixtures. Data for the current study come from the 'Survey of the Health and Living Status of the Elderly in Taiwan,' a longitudinal panel design study with six waves of data collection (1989, 1993, 1996, 1999, 2003 and 2007). Estimation will be completed with a new STATA-based version of the group-based trajectory model that simultaneously accounts for drop-out due to mortality.

Results. The earlier paper indicated, in contrast to much understanding, that there is no identifiable aggregate group of oldest-old Chinese that experiences disability recovery and almost all undergo increasing disability from age 80 until death, although at different rates of decline. The results in this paper evaluate whether these results can be generalized to a Taiwan population that is younger, hypothesizing that trajectory groups are characterized by varying patterns of increasing levels of disability with age. Also, based on earlier research in Taiwan, results show whether women and those with lower levels of education fall into the more unfavorable disability trajectory types (Zimmer, Martin and Chang 2002).

Conclusion. The paper concludes by examining the implications of the findings and the group-based trajectory model for better understanding the potential effects of aging on disability versus disability-free life in Taiwan.

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Yuruo Yan///

Disparities in Activities of Daily Living Between Elderly Males and Females in China

China faces serious challenges as a result of its graying population, sharply rising numbers of the elderly and issues facing this population have outpaced the country's steps towards modernization. Life expectancy and chronic disease and disability are all increasing. With women making up the majority of China's rapidly aging population, studying gender difference among the elderly with loss of ADL function is helpful towards reducing or eliminating the health gap between females and males caused by controllable, unfavorable factors; minimizing the actual differences in health between genders; and improving the general health and overall quality of life of the elderly in China. This thesis is based on the data of a one-time sampling survey of the elderly living in rural and urban areas of China in 2006 and describes gender differences in the demographic, social and economic characteristics of the elderly. Gender differences between the level and scale of loss of ADL function are compared from the perspectives of age, socio-economic status, rural and urban living and region. The Blinder-Oaxaca decomposition model builds on the results analysis to deconstruct gender differences in the risk of loss of ADL function between the rural and urban elderly and distinguishes the factors and contribution rate of each factor to explain the gender disparities. The socialization of sex roles is used as a tool to analyze the gender gap in ADL function in old age. The influence of gender on the socioeconomic status for men and women is discussed. Based on the results of the data analysis, this study makes the following conclusions:

1. Among the elderly in China, the risk of occurrence and the severity of ADL function loss show a clear gender difference: Risk of occurrence is higher for females while severity of loss is higher for males.

2. Among elderly Chinese, education level, age, number of patients with chronic diseases, economic status, property ownership, health care coverage rate, psychological state and distribution of health care show clear gender differences and these differences can, to varying degrees, explain the gender difference in the loss of ADL function among the elderly.

3. There are clear differences in social, economic and health levels between the elderly living in urban and rural areas. The gender difference for the occurrence and risk of loss of ADL is higher for the elderly living in rural areas than for those living in urban areas. The factors explaining this difference are not the same for the rural and urban elderly.

Based on the results of data analysis and discussion, the following are recommended:

1. The influence of gender socialization on gender gap in health should be eliminated. Education should strive to reduce the idea that boys are better than girls, which has led to a gender imbalance in the population. The same rights to proper nutrition, health care and education must be shared equally between the genders. Through policies and laws, the gender barrier in occupations and the workplace must be torn down to allow both men and women the right of free choice in public and private life. At the same time, we should consider the specific needs related to the female reproductive role. In public policy making, gender-blindness should be avoided.

2. The socio-economic, cultural and health disparities between rural and urban areas are clear, requiring policies that take into account the differing needs of the populations living in these areas. Additionally, these disparities require the development and implementation of polices to rapidly close the gap and end the history of discriminatory policies between rural and urban areas while promoting equal opportunity for all people.

Khaled Qalalwa, M Khawaja, H Brønnum-Hansen///

Health expectancy in Palestine 2006

Background: The population of Gaza Strip and the West Bank comprises almost 4 million Palestinians. The Israeli occupation has a strong impact on living conditions and health of the population. According to WHO gross national income per capita in the Occupied Palestinian Territory is 20 times less than that of Israel. Life expectancy differs

by about 8 years. The purpose of the study was to estimate health expectancy for the Palestinian population in Gaza Strip and the West Bank.

Methods: The study was based on Palestinian life tables and prevalence on health status derived from the Palestinian Health Survey carried out in 2006. The survey comprised information on 16,855 interviewees (8,488 men and 8,367 women). On the basis of questions about chronic disease and disability expected lifetime with chronic disease and lifetime with disabilities were estimated by Sullivan's method.

Results: Life expectancy at age 20 was 52.8 years for men and 55.1 for women. Expected lifetime with a chronic disease was 15.1 years and 22.5 years for 20-year-old men and women, respectively. Lifetime with disability (moderate or severe) was 3.6 years for both sexes.

Conclusions: The study presents the first health expectancy estimates from the Occupied Palestinian Territory. The half million Israelis living in illegal settlements on the West Bank and almost 5 million exiled Palestinians were not represented in the study. The results demand for health expectancy estimates from other Middle East countries for comparison purposes.

Dustin Brown///

Spousal Education and Morbidity in the United States

Background: Education is inversely associated with most chronic and acute health problems. Though researchers typically conceptualize education as an individual-level resource, a number of recent studies—primarily examining data from European and Israel populations – suggest that education is a pooled, or household, resource within a marriage. These studies find a consistent link between spousal education and a variety of health outcomes. To date, however, the evidence linking spousal education to specific health conditions is sparse, particularly in the United States. Therefore, the purpose of this paper is to examine the association between spousal education and morbidity in the United States.

Methods: The data in this study come from the US National Health Interview Survey (1997-2009). A series of nested regression models are estimated to examine the link between spousal education and cardiovascular disease, cancer, musculoskeletal health, metabolic disorders, and psychological well-being net of demographic characteristics, household income, and health behaviors. Particular attention is paid to identifying gender differences in these associations.

Results: Preliminary results suggest that own and spousal education share an inverse association with cardiovascular disease, musculoskeletal health, metabolic disorders, and psychological well-being. One's own education shares a negative association cancer, but spousal education is not associated with cancer. As expected, these associations are attenuated once controls for household income and health behaviors are introduced. Overall, the patterns are similar for men and women. However, a notable exception to this is found for psychological well-being. Women report higher levels of psychological distress at all levels of own and spouse's education than do men.

Conclusions: Own and spousal education share an independent association with several common causes of morbidity. Except for psychological well-being, spousal education appears to operate similarly for women and men. Models that omit spousal education among the married may overestimate the importance of an individual's own education. The results suggest that is a household resource within the confines of marriage.

Jean-Marie Robine, EHLEIS core group///

The joint Action : European Health and Life Expectancy Information System (EHLEIS)

The Healthy Life Years (HLY) indicator is a Summary Measure of Population Health (SMPH) indicating the number of remaining years that a person is expected to live free of disability. HLY was included as a Structural Indicator in 2005 with the main purpose to monitor health trends and gaps in Europe.

The objective of the Joint Action (JA) is to increase the utility of HLY through the consolidation and further development of the EHLEIS information system, increased comparability with US and Japanese SMPH and greater use by MS in national policy-making. The JA will: (i) compute and disseminate HLY through an online information system and annual country reports, (ii) monitor EU trends in LE and HE to identify public health priorities, (iii) develop methods for computing comparable HE by socio-economic status, (iv) contribute towards identifying the main determinants of healthy life in Europe,(v) integrate the former Task Force on Health Expectancies (TFHE) into an annual meeting to further engage MS with HLY, and (vi)propose a blue print for a common international SMPH with the US and Japan.

Key cross-cutting EU policies such as the Lisbon agenda and the Sustainable Development Strategy include HLY within their list of indicators. In 2005 the Commission stated that "increasing HLY is crucial in attracting people into the labour market" (COM

2005/24). More HLY means a healthier workforce, less retirement due to ill health and potentially less health and social care use and is thus a means of reducing the economic and social risks associated with demographic change. Accurate monitoring of HLY across MS is crucial to plan for our ageing population but also to understand the impact of national policies to increase healthy ageing.

The JA will contribute directly to two of the three objectives of the Second Programme of Community Action in the Field of Health 2008-2013: to promote health, including the reduction of health inequalities – specifically increasing healthy life years and promoting healthy ageing; and to generate and disseminate health information and knowledge.

A wide range of methods will be necessary to achieve the aims. Computational and web methodologies and standard demographic techniques will form the basis for the Information System. The substantive analyses of trends and gaps will use statistical techniques including macro, micro and multi-level analyses. Linguistic methods will be used to extend the web facilities to multiple European languages.

The main outcomes will be: (i) an Information System allowing online calculation of various health indicators (prevalence, LE and HE) – all current HLY-related websites will be reorganized in a new EHLEIS website, (ii) annual Country reports on health expectancy translated into national languages, (iii) proceedings of the annual meetings to replace the TFHE, (iv) improved statistical tools for attribution and decomposition, (v) technical reports and scientific papers on key methodological advances and substantive results on inequalities between MS and potential drivers, (vi) blueprint for an internationally harmonized summary measure of population health (SMPH).

Our target groups are MS in general, health and non-health policy makers at MS and EC level, health professionals and researchers as well as the media and general public.

Kathryn Backholer, H Mannan, H Walls, D Magliano, A Beauchamp, C Stevenson, J Shaw, A Peeters///

Projected disparities in the prevalence of obesity among Australian adults.

Background. The prevalence of obesity is increasing worldwide with those from lower socioeconomic groups disproportionally represented in most developed nations. The impact of future trends in obesity on the socioeconomic gradient of obesity is unknown.

Methods. We used life table analysis of the 5-year follow-up of the national population survey, the Australian Diabetes, Obesity and Lifestyle study (2000–2005, n=10,994, AusDiab) to project the prevalence of normal weight, overweight and obesity by educational attainment for every 5-year period from 2000-2025. Age-specific probabilities of transitioning between BMI categories, estimated using logistic regression, were entered into education-level-specific incidence-based multi-state life tables that simulated the BMI progression of the Australian adult population.

Results. If current observed rates of weight change persist, the prevalence of obesity amongst individuals with the lowest level of educational attainment is estimated to increase from 23% in 2000 to 44% in 2025. Among individuals with a degree qualification or higher the prevalence of obesity is projected to increase from 14% in 2000 to 30% in 2025. The prevalence of normal weight is predicted to decrease for those with the lowest and highest levels of educational attainment from 39% and 47% in 2000, to 22% and 33% in 2025, respectively.

Conclusion. The difference in obesity prevalence between those with high and low educational status is likely to increase into the future. It is essential that obesity prevention interventions focus not only on reducing the total population burden of obesity, but also on narrowing socioeconomic disparities in the prevalence of obesity. Incidence based models, such as the one utilised in our analysis, are essential if we are to capture the future implications of current trends in risk factors.

J Liu, G Chen, I Chi, J Wu, L Pei, X Song, L Zhang, L Pang, Y Han, Xiaoying Zheng///

Regional variations in and correlates of disability-free life expectancy among older adults in China.

Objectives. To address the influence of China's economic reforms on measures of population health and regional mortality rates.

Study Design. Cross-sectional analysis.

Methods. Using data from the three most recent national censuses, we used model life tables method to calculate life expectancy and examined mortality and population health patterns by gender, GDP, province, and region from 1980 to 2000.

Results. Life expectancy varied by economic status, province, geographical region, and gender. Results showed that although life expectancy in China has increased overall since the early 1980s, regional differences have become more pronounced. People living in the eastern coastal provinces have longer life expectancies than those in western regions, which is related the women and men social status and family work.

Conclusions. Differences in life expectancy are primarily related to differences in regional economic development, which in turn exacerbate regional health inequalities. It is necessary to improve economic development in less developed regions and to establish health policies and a public health system that address the needs of all people.

Keywords economic development, health inequalities, life expectancy, model life tables, mortality

Andrew Kingston, L Robinson, J Collerton, K Davies, J Bond, T Kirkwood, C Jagger///

Gender difference in disease patterns and their impact on disability in the oldest old : results from the Newcastle 85+ Study

Background. Although the oldest old (85+) are the fastest growing section of the population there is little up-to-date information about their health, disease patterns or disability and the respective gender specific diversity. Evidence of gender differences in the amount of disease has already been reported in the Newcastle 85+ Study with women having an average of 5 diseases compared to 4 in men. This presentation will explore (i) whether the patterns of disease differ between men and women; (ii) the population attributable fractions (PAPF) of a range of diseases on disability; (iii) whether the patterns of disease are related to short-term (18 month) mortality differentially for men and women.

Methods. A cohort of 85 years olds was recruited during 2006 (i.e. born in 1921) from general practices in Newcastle and North Tyneside, UK. Participants were visited in their current residence (including home or institution) by a trained research nurse. The assessment protocols consisted of a detailed multi-dimensional health assessment (HA) and/or review of their general practice records. A disability score was calculated from the inability to perform without difficulty each of 17 instrumental and basic activities of daily living with a score of zero denoting no difficulty in any item. From diseases determined in the general practice records, a disease count was constructed over 17 key diseases; including COPD, other respiratory diseases, eye disease, arthritis, osteoporosis, Parkinson's disease, peripheral vascular disease, hypertension, diabetes, atrial fibrillation and flutter, IHD, heart failure, renal impairment, anaemia, thyroid disease, cerebrovascular disease and dementia. Cluster analysis was performed and gender differences tested. We calculated the PAPF for each disease with disability by calculating the joint attributable fractions from within a Poisson regression model using Stata.

Results. A total of 722 participants provided complete data on diseases and disability. Overall 74.0% had a disability score of 0-6 (78.6% men, 70.8% women) whilst 18.7% scored 7-12 (15.2% men, 21.1% women) and 7.3% 13+ (6.2% men, 8.1% women). Four disease clusters were formed with membership of clusters differing between men and women. The diseases explained over 80% of disability with the highest PAPF for moderate disability (7+) attributable to arthritis (22.7%) and anaemia (17.5%) and for severe disability (13+) the largest PAPF's were attributable to arthritis (43.8%) and dementia (43.6%)

Conclusions. The oldest old have a high burden of disease but this occurs in distinct patterns. At a population level arthritis, dementia and anaemia appear to have the greatest impact on severe disability with implications for targeting of treatments and technologies.

Scott Lynch, S Brown///

The Role of Socioeconomic Status in Producing Sex Differences in Healthy Life Expectancy in the US over the last four decades

Background. Sex differences in both health and mortality are well known, as are sex differences in socioeconomic status (SES). Despite the narrowing of the SES gap between men and women over the last several decades, a substantial disparity in health and mortality remain. Some have proposed that the gender gap may be attributable to fundamental biological differences between men and women. The persistent gender gap in mortality, as well as the seeming ongoing support for the expression—«women get sick ; men die »—seems consistent with a biological hypothesis. If the biological hypothesis is true, however, it seems that the gender gap in healthy life (HLE) may be immune to policy change and social change more generally. A simple way to examine the biological hypothesis is to consider the role that SES differences between men and women plays in accounting for the gender gap in HLE across time. If the biological hypothesis is true, we should expect to see very little change in the importance of SES in explaining gender disparities in HLE. In contrast, trending in the relative importance of SES in explaining gender disparities suggests that social factors, and not simply biological ones, are important.

Methods. We use a new extension of Sullivan's method that allows for the estimation of variation in HLE when mortality data used to produce a life table and survey data used to obtain prevalence rates are measured at differing levels of refinement. Most mortality rate data are only disaggregable by age, sex, and race, while survey data can be

aggregated by age, sex, race, SES, and other factors. Here, we use this new method applied to national level vital statistics data and survey data from the National Health Interview Survey across four decades to examine the trend in the proportion of the gender gap in HLE that is due to SES differences between genders.

Results. Preliminary results reveal that, since 1980, men have experienced more rapid increases in the proportion of life to be spent healthy (PLE) than women. However, almost all of the differential is explained by SES differences between genders. In some periods, women's PLE exceeds men's after controlling on SES.

Conclusions. The results suggest that social processes play a highly significant role in accounting for gender differences in PLE. That SES differences between gender account for almost all of the gender difference in PLE provides strong support for a social (vs. biological) hypothesis. That the role of SES varies over time provides even stronger support.

Herman Van Oyen, P Kolip, EHLEIS///

Gender differences in Healthy Life Years within the EU : an exploration of the "health-survival" paradox

Background. In industrialized countries life expectancy in women is higher than in men, but the mortality advantage of women is in many countries balanced by a disability disadvantage. This contrast is called the female-male health-survival paradox. We investigate the health-survival paradox within the EU by partitioning the gender difference in HLY into a part due to mortality and a part due disability in order to evaluate if the mortality advantage and/or disability disadvantage of women vary between countries with high versus low life expectancy.

Methods. Disability prevalence was measured using the Global Activity Limitation Indicator and provided in 2006 by the Survey on Income and Living Conditions (SILC) in 25 European Member States. Healthy Life Years (HLY) were estimated at age 15 years using the Sullivan method. The gender difference in LE (Life Expectancy), HLY and ULY (Unhealthy Life years) were split into two components: 1) the proportion due to the inequality in age specific mortality rates or the "mortality effect" and 2) the proportion due to the difference in the age specific prevalence of activity limitations or the "disability effect" using a method proposed by Nusselder. To evaluate the health-survival paradox we investigate the relationship between the mortality advantage and disability disadvantage that women experience over men and the duration and/or the gender gap in the duration of total, healthy or unhealthy life at age 15 using random-effects meta-regression models. In a first set of models (model 1) the duration of life in different health states or the gender difference in the duration of life in different health states was entered univariately. In a second set of models (model 2), the country specific life expectancy of women and the gender difference were entered simultaneously.

Results. In all EU countries, women's LE at age 15 years, always exceeded male's LE, but LE varied substantially across countries as did the gender difference which varied from 3.5 to 11.6 years. The variation in the gender difference in HLY was smaller than that in the difference in LE. In 7 countries (Cyprus, Denmark, Germany, Italy, the Netherlands, Portugal and Spain), men at age 15 can expect to live more years without activity limitations than women, the gender difference in HLY reaching statistical significance in 3 of these countries (Cyprus, the Netherlands and Portugal). In all countries, the mortality advantage of women over men, contributes to more HLY in women but in all but two countries (Austria and Estonia), the value of the disability effect on HLY is negative, meaning that women's higher prevalence of activity limitations reduces the gender difference in HLY. In populations with a high LE, the gender difference (women – men) in HLY was small or even negative. In populations with less favorable population health indicators such as low LE, low HLY and high ULY, the hardship among men is already evident at young ages (15 to 49 years) both with a higher mortality compared to women and a prevalence of activity limitations which is closer to the female prevalence.

Conclusion. In countries at the lower level of health, men are in the worst position having not only a higher mortality compared to women but also a high prevalence of activity limitations. Additionally, in contrast to men in populations with a high health profile, the ill-health of these men begins early in life.

Luc Bonneux///

Forecasting ADL disability in the European Union

Background. The objectives are to assess the actual and future numbers of elderly care-dependent people in the EU. Three EU countries have been selected for forecasts of long term care: Spain, Germany and the Netherlands (a new EU member state will be added). The method used can be applied to all countries with population forecasts and data on prevalence of ADL disability, BMI and smoking. These countries are representative of the European epidemiology and long term care provision. We choose disability in basic activities of daily living ("Katz") as the most meaningful and

reproducible outcome across countries. We forecast the numbers of people with at least one disability from 2008 till 2060.

Data and methods. We use European SHARE data for estimates of basic ADL and obesity prevalence, and the Rotterdam Study for estimates of ADL mortality, by age, sex, BMI class and smoking history. Incidence is back calculated from prevalence and mortality to generate multistate life tables and to study the effects of policy scenario's. The population forecasts of the EUROPOP2008 scenario's are the basis for our disability projections, enhancing consistency. We define two extreme scenario's, where the incidence of disability is dependent of time since birth (age) or of time before death. Further, we define a quit smoking scenario and three obesity scenarios, based on past trends in the US and Europe.

Results. ADL disability is higher in women than in men, and the effect of obesity on disability is again higher in women than in men. The aging of the population will always cause sharp increases in ADL disability, but life extension causes large differences dependent from the scenario "age since birth" or "age before death". Quitting smoking paradoxically increases disability, as smoking related mortality is high, but the effect is small. As obesity related mortality is low, many obese will survive but with BMI related disability. Women are hit twice, by their longer life and higher risks of BMI related disability.

Conclusions. It is certain that future ADL disability will be high, a consequence of the aging European populations. Smoking and BMI scenario's show that disability and mortality may move independently, smoking by killing and obesity by disabling. Successful policies succeeding in lowering the numbers of obese people, will be rewarded by decreased long term care needs, particularly among women. This is explained by lower muscle strength and more vulnerable weight bearing joints, a consequence of adaptations to child birth and upright walking. However, future scenarios remain highly uncertain, by the lack of comparable estimates of ADL disability in European countries and even more by the lack of secular trends in ADL disability. This may change in the near future, as more pan European studies such as SHARE become available.

Jennifer Karas Montez, M Hayward///

The Gender Gap in Active Life Expectancy: Does Women's Longer Life in Worse Health Originate in Early Life?

Background. Research on women's poorer physical functioning but longer life expectancy compared with men has emphasized inequities in adult circumstances, such as socioeconomic status and health behaviors, but has largely fallen short of fully accounting for the pattern. Recasting this research within a life-course, epidemiological framework points to the likely role of early-life conditions in anchoring the pattern. Early-life conditions launch trajectories of adult (dis)advantages that may shape functioning and longevity, and they may also impart a biological imprint on these outcomes, in ways that differ for men and women. For example, early life nutrition may be more consequential for women's than men's risk of osteoporosis (Kin et al. 2007) and obesity (Ravelli et al. 1999) in later life. Currently, we know little about whether and why early life conditions anchor the gender gap in functioning, longevity, and their intersection, active life expectancy (ALE). This study responds to this gap and addresses the following questions for women vis-à-vis men.

To what extent do early-life socioeconomic conditions (measured by parental education) predict deterioration and improvement in functioning, net of adult conditions (measured by own education)?

To what extent do early-life socioeconomic conditions predict ALE, net of adult conditions?

Do adults who experienced adverse early-life socioeconomic conditions spend a greater proportion of their lives functionally impaired compared with those from advantaged conditions, or do they spend a similar proportion of life impaired but within a truncated lifespan?

Methods. The data come from the Health and Retirement Study, which is a panel study of U.S. adults 50 years of age and older and their spouses. At each biannual survey wave from 1996-2008, we classified adults as deceased or into one of four functioning states resembling Nagi's Disablement Framework (no functional impairment of any kind, functional limitations, difficulty with instrumental activities of daily living, difficulty with basic activities of daily living), and then built a person-year file. In gender stratified analyses, we first estimated annualized transition rates for each of the 16 potential transitions (e.g., between four functioning states and death), and then used the rates within multistate life tables to estimate ALE.

Preliminary results. For men and women, rates of deterioration in functioning reflected socioeconomic conditions from early life and adulthood, while rates of improvement in functioning and of mortality mainly reflected adult socioeconomic conditions. In general, early-life conditions were more strongly linked with women's than men's functioning transitions, and more strongly with men's mortality risk. ALE estimates are in progress.

Preliminary Conclusions. Functioning, longevity, and ALE reflect conditions across the life course in ways that differ for men and women. We anticipate that adverse early-life conditions expand the proportion of life functionally impaired.

Henrike Galenkamp, A Braam, M Huisman, D Deeg///

Trends in Subjective and Objective Health in Dutch Older Men and Women

Background. It is known that life expectancy in old age has increased, but the question remains whether older people have become more healthy or not. Poor subjective health is often used to study trends in population health. However, it is necessary to study trends in subjective health in the context of changes in objective health, because previous studies have shown that trends in different indicators may diverge. This study investigates trends in the prevalence of both subjective and objective health and trends in their associations in older men and women between 1992 and 2009.

Methods. Data from six measurement waves (between 1992 (T1) and 2009 (T6)) of the Longitudinal Aging Study Amsterdam (LASA) were used. LASA is a prospective cohort study of 4,109 older adults (aged 55+). Included in the analyses were men and women aged 60-85 years. Subjective health was assessed with the question: 'How is your health in general?' Objective health indicators included multimorbidity of chronic conditions and disability. The presence of the following conditions was assessed: chronic non-specific lung disease, heart disease, peripheral atherosclerosis, stroke, diabetes, arthritis and cancer. Disability was assessed with six questions on daily activities. Mild disability reflects having difficulty with at least one activity; severe disability as being unable to perform at least one activity independently. Longitudinal regression analysis (GEE) was applied to study the effect of time on each health indicator. Interaction terms for time and objective health indicators were included to study trends in associations between objective and subjective health.

Results. Worsening trends were observed between T1 and T6 in having one or more (74.0% vs. 83.3%) or two or more diseases (38.8% vs. 53.0%), as well as in mild disability (21.2% vs. 33.2%). At the same time, the prevalence of severe disability decreased (27.5% vs. 20.7%). However, no overall shift in the level of subjective health was found. Men aged 75 and over showed the strongest increase in chronic diseases, and experienced a slight decline in subjective health as well. Associations between objective and subjective health changed. Severe disability showed a stronger impact on subjective health over time ($p < 0.05$). The association between chronic diseases and subjective health became less strong over time, but only in women aged 60-74 ($p < 0.01$).

Conclusions. Health trends between 1992 and 2009 in Dutch older persons (aged 60-85) have been diverging: although the prevalence of chronic diseases and mild disability increased, subjective health remained relatively stable. Subjective health is increasingly determined by experiencing severe disability, the prevalence of which decreased.

Karin Modig///

Future disease burden of the ageing population in Sweden

Background: The ageing population has consequences for the health care sector in terms of an increased demand for health care services. In Sweden this will be particularly evident around year 2025 where the large generation born in the 1940-ies will be over 80 years old. The increase in number of disease events, and consequently the burden for the health care sector, will depend on three things, the change in population size, change in population structure and the health status of the population, or more specifically changes in the incidence rates for the major disease outcomes such as myocardial infarction (MI), stroke and cancer.

Material and Method: Based on national registers with information about inpatient care and causes of death by diagnose, we have studied the age specific incidence rates for MI, stroke and cancer over time and made projections of the changes in incidence rates in the forthcoming decades. The increase in the number of cases that is a consequence of population growth is separated from the part of the change that is due to changes in population structure. We also calculated how much the incidence rates would have to decrease to maintain a stable number of MI/stroke/cancer events in Sweden in 2050 compared with 2010. First event by diagnose was used.

Results: We projected the number of MI events to increase with approximately 60% from 2010 to 2050, from 18283 to 29977 events in 2050 for men and approximately 50%, from 12690 to 18997 events for women. Both population growth and change in population structure come into play but the latter has a greater effect in explaining increasing number of events in MI, especially among women. The required decrease in incidence rates in order to keep the number of MI events constant over time is -1.2% for

men and -1% for women. Over the past decades, the incidence rate for MI has decreased with 1-2% yearly. Equivalent analyses for stroke and cancer have been done and show similar results. They will be presented at the meeting if the abstract is accepted.

Conclusion: Even though the demographic changes, primarily change in population structure, will be substantial in the forthcoming decades, the ageing population might not be such a heavy burden for the health care sector as speculated.

Alison van Raalte P Martikainen, M Myrskylä///

Trends in life span variation by sex, occupational class and causes of death.

Background. At the macro level, decreases in adult lifespan variability have mostly stagnated since the 1960s, despite continued improvements in longevity. At the micro level, while high remaining life expectancy at age 35 was associated with low lifespan variation at age 35 by socioeconomic group at the cross section, trends in this association over time are unknown. In this study we investigated whether socioeconomic groups experienced mortality compression with life expectancy improvements or whether their entire lifespan distributions shifted to higher ages with increases in life expectancy.

Methods. We tested both scenarios using Finnish period data by sex, age, occupational class and cause of death from 1971 to 2007. We performed age and cause-of-death decompositions of lifespan variation for each sex (a) by occupational group over time and (b) between occupational groups at the same level of life expectancy. We separated trends in lifespan variation at younger and older ages. Finally, we examined trends in external cause deleted lifespan variation.

Results. Trends were different by occupational group but similar for both sexes. Manual workers had stagnating lifespan variation over time while the higher occupational groups experienced mortality compression owing different trends in premature mortality. All subgroups showed remarkably similar lifespan variation at older ages, particularly when compared at similar levels of remaining life expectancy. Although differences over time in lifespan variation were driven by reductions in circulatory diseases, at the same level of life expectancy the high lifespan variation of the manual class was due to substantially higher levels of mortality from external causes. Mortality from external causes shaped much of the differential trends in lifespan variation by occupational class since 1970.

Conclusions. Stagnating lifespan variation alongside increasing life expectancy does not need to be a universal phenomenon. As the upper non-manual class has shown, adult mortality compression can be compatible with rising life expectancy. To do so requires addressing the high premature mortality of the lower socioeconomic groups, especially from external causes, for both men and women.

Howard Meltzer///

Is disability a risk factor for suicide attempts?

Background. Disability has long-term practical and social consequences, and is associated with mental disorders, in particular with depressive disorder. It is likely also to be associated with suicidal ideation and behaviour. We investigated disability in relation to suicide attempts hypothesising that such attempts would be more common in people with a disability, and that this would be commensurate with the number of daily activity limitations. We also hypothesised that the effect of disability on suicidal behaviour would be mediated by social isolation. Finally we examined whether particular disabilities were more strongly associated with suicide attempts.

Method. A random probability sample comprising 7461 respondents were interviewed for the third national survey of psychiatric morbidity of adults in Great Britain throughout 2007. The prevalence of suicide attempts in the past week, past year and lifetime was assessed. Disability was measured by difficulties in activities of daily living (ADL) and instrumental activities in daily living (IADL).

Results. About one in every 150 adults In England had made a suicide attempt in the 12 months prior to interview. Those with some form of disability were four times more likely to have attempted suicide after controlling for significant socio-demographic and socioeconomic correlates: female, not married, not employed, being in debt and having a physical health problem. Difficulty in managing ones financial affairs (budgeting and paying bills) and dealing with paperwork (writing letters and filling in forms) were independently associated with suicide attempts. Feelings of loneliness and social isolation partially mediated the relationship between disability and suicide attempts.

Conclusion. Both policy makers and carers need to be aware that helping people with cognitive as well as physical tasks is an important element in a suicide prevention strategy.

Ardo Van Den Hout R Marioni, F Matthews///

Estimating life expectancies using a multi-state model for stroke with sex and education as risk factors.

Multi-state survival models can be used to investigate and predict health-related processes over time. In a continuous-time model, the hazard of a transition from the current state to a next state can be linked to covariates such as year of birth, sex, and education.

A three-state illness-death model for history of stroke will be presented. Individuals in state one have no history of stroke, whereas those in state two have had one or more strokes. State three is the death state. Transitions from state one to state two are interval censored, but death times are known.

Of interest is how total life expectancy at a given age (residual life expectancy) subdivides into stroke-free life expectancy and life expectancy with a history of stroke. Stroke is used an example of cardio-vascular disease. More generally, the three-state model can be used to estimate healthy life expectancy where healthy is defined as free of cardio-vascular disease.

Longitudinal data from the MRC Cognitive Function and Ageing Study (www.cfas.ac.uk) are analysed. Special attention will be given to the effects of gender and education. In the UK, education is often used as a proxy for social class.

We present results for Newcastle. For women with less than ten years of education, aged 70 and born in 1920, stroke-free life expectancy is 9.2 years (with 95% confidence interval: 8.6; 9.7), and total life expectancy is 11.2 years (10.8; 11.7). For men with the same age and background these numbers are 7.1 (6.8; 7.5) and 8.6 (8.2; 8.9). The effect of education can be illustrated by stroke-free life expectancy estimated at 10.3 (9.5; 11.1) for women with ten or more years of education (aged 70, born in 1920).

User-friendly and free software for the estimation of the multi-state model and the additional estimation of life expectancy will be briefly discussed.

Hiram Beltran-Sanchez, J Ailshire///

Sex Differences in the Risk of Death by Health Status, Physical Functioning, and Health Behaviours

Background. Research on the oldest-old has typically focused on national level studies of mortality and survivorship based on vital statistics records. Nonetheless, individual level factors play a crucial role in understanding the health dynamics of the oldest-old population, particularly in survivorship. These factors may be especially important for understanding sex gaps in survivorship and life expectancy. In this paper we address the question of how socioeconomic and demographic characteristics, health status and health behaviors are associated with sex differences in oldest-old mortality and survivorship among people who have survived to old age.

Methods. We analyzed data from the 1990 and 1991 National Health Interview Survey's Health Promotion and Disease Prevention Supplement, a nationally representative sample of non-institutionalized U.S. adults aged 18 years or older who took part in in-person interviews. Individual data from the supplement were linked to prospective mortality data from the National Death Index (NDI), with follow-up through December 2002. The analytic sample is restricted to 10,619 women and 5,844 men aged 65 years and older, with 8,522 deaths recorded during follow-up (51.6%). We study sex differences in the risk of death by activity limitation and physical activity using a Poisson log-linear model (proportional hazard model). We also plan to examine sex differences in mortality by chronic conditions, smoking and alcohol consumption.

Results. Preliminary results indicate that educational differences in the risk of death are more pronounced among men than women but only among the young-old (age 65 to 84). These differences translate into about 2 additional years of life for more educated relative to less educated young-old men, but only 1 year additional year of life among more educated young-old women. Having an activity limitation is associated with a similar risk of death for both men and women among young-old adults, but a larger risk of death among men at the oldest ages (age 85 and older). Contrary to this result, among individuals who have no activity limitation, women who do not exercise have a higher risk of death at older ages than men. Thus, having an activity limitation translates into larger educational differences in life expectancy among men than women for young adults, but larger differences among women at older ages. Similarly, among people who have no activity limitation and who do not exercise, there is a larger educational difference in life expectancy for men than women among young-old adults, but very similar educational differences at the oldest ages.

Conclusion. Activity limitation and exercise status, in combination with education, have a different association with the risk of death for men and women at different ages. We observed larger educational differences in life expectancy among young old men than women, but opposite results at older ages; particularly among those with activity limitation. In further analysis we will study sex differences in mortality and survival by chronic conditions, smoking and alcohol consumption.

Lidia Loukine, C Waters, J Ellison///

Life Expectancy and Health Adjusted Life Expectancy Among Canadians with Hypertension and Diabetes Mellitus

Background. Currently, about 19 % of the Canadian population have been diagnosed with hypertension (HBP) and about 6% with diabetes mellitus. Hypertension is a leading modifiable risk factor for many chronic diseases. Hypertension and diabetes often co-exist; more than 60% of people diagnosed with diabetes (DM) were also diagnosed with hypertension. When one or both diseases are present the life expectancy (LE) and Health-Adjusted Life Expectancy (HALE) are significantly reduced. Since HALE combines mortality and Health Related Quality of Life (HRQOL) information into a single indicator it can help to evaluate the impact of diabetes and hypertension on population health. The objectives of this study were to estimate HALE for the Canadian population by sex and age, and evaluate the health gap (HALE difference) between populations without and with disease.

Methods. Life tables were generated using the 2004-2006 mortality data obtained from the Canadian Chronic Disease Surveillance System using linked provincial/territorial health administration databases. These abridged period life tables were constructed following the Chiang method except for the open ended age-interval where the Hsieh method was employed. The Health Utility Index Mark 3 from the Canadian Community Health Survey (2001-2005) was used as a measure of HRQOL. HALE was computed using the Sullivan method.

Results. HALE at birth for females without HBP was estimated to be 73.4 years (males: 71.1). HALE at birth for females who will develop HBP by the age of 20 was estimated to be 67.2 (males:65.0).The health gap for females was 6.2 years and for males was 6.1 years. HALE at birth for females without/with DM was estimated to be 73.3/62.2 years (males: 70.9/60.1). The health gap for females was 11.1 years and for males was 10.8 years. All health gaps were statistically significant. HALE at birth for females with both DM and HBP was estimated to be 58.1 years (males: 56.0).

Conclusions. These results provide robust and policy relevant information on HALE by HBP and/or DM.

Patrick Deboosere, H Van Oyen///

Gender differences in mortality by self-assessed health: a 3 year follow-up study of the Belgian population

Study objective. To describe the relation between self rated health and mortality by gender using the statistical power of census data and matched register data.

Design. Analysis of mortality rates and hazard ratios of death during a 39 month follow up of the total Belgian 2001 census population aged 6 and above in relation to self-assessed health. Calculation of life tables by reported health status and of hazard functions using Cox regression allow for a detailed description of the evolution of the relative risks by health status, age and gender.

Main results. As expected the strong association between self rated health and mortality is confirmed. But more interesting is the gender specific relationship with a changing pattern by age. However, the results show also that the predictive power of self assessed health for mortality appears to be relatively comparable among men and women.

Conclusions. The observed relationship in the Belgian 2001 census between SAH and mortality is specifically formed by the economic and institutional context, the historical evolution and the actual stage of the health transition in Belgium. The observed gender differences in the Belgian population are relatively small compared with the overall strength of the relation. It is possible that the diverging reports in the literature on gender differences in SAH and in the association with mortality may be influenced by the smallness of the samples or the (age) window used in many studies. Differences in SAH by gender inside a given cultural setting will only marginally reflect differences in meaning of health. It is also possible that health differences between men and women are declining at younger ages, while differences in mortality at the older ages, mainly taking lives of both men and women in less good health, help to equilibrate the proportions in good health by age.

Vanessa Young, Chi-Tsun Chiu, Y Saito///

What is the active life expectancy of elderly Japanese with and without stroke? An application of the SPACE program

Stroke is a debilitating condition that can severely limit the ability of individuals to perform daily living activities and lead an active life. In this study, we investigated and compared the active life expectancy of elderly Japanese with stroke and without stroke.

Five waves of nationally-representative data from the Nihon University Japanese Longitudinal Study of Aging (NUJLSOA) over a 10-year period (1999, 2001, 2003, 2006, 2009) of 4,997 Japanese aged 65+ at baseline were used for the analyses. Disability was measured by difficulty in performing at least one of 14 basic and instrumental activities of daily living. Multi-state life table (MSLT) methods were employed and the Stochastic Population Analysis for Complex Events (SPACE) computer program was used to estimate MSLT functions and their sampling variability.

Preliminary results (before adjusting for differences in survey interval length) from the simulation models (simulation cohort N=100,000; bootstrap N=300) showed that at age 65, both men and women who had experienced a stroke can expect to live significantly fewer years of total life and active life, and more years of inactive life, compared to their counterparts without stroke. Specifically, 65-year-old Japanese men who had stroke can expect to live another 16.1 years (CI: 15.1-17.1) of which 10.2 years (CI: 8.6-11.8) are active and 5.9 years (CI: 4.7-7.1) are inactive. This is contrasted with same-aged men without stroke, at 20.6 years (CI: 20.2-21.0) of total life, of which 16.6 years (CI: 16.0-17.2) are active and 4.0 years (CI: 3.6-4.4) are inactive. For women, the corresponding figures are 19.1 (CI: 17.9-20.3), 10.3 (CI: 8.5-12.1), 8.8 (CI: 7.2-10.4) for women who had stroke and 24.2 (CI: 23.6-24.8), 17.1 (CI: 16.5-17.7), 7.1 (CI: 6.5-7.7) for women without stroke, for total, active, and inactive life expectancy, respectively. Overall, elderly Japanese who had stroke have a smaller proportion of active life expectancy compared to their healthy counterpart (63.4% vs. 80.6% for men; 53.9% vs. 70.7% for women). We discussed the implications of our findings in the paper.

Alexis Montaut, E Cambois///

People with impairments and their general health status: How far could improved health decrease their risk of social disadvantage?

Context. People with impairments and functional limitations are at increased risk of health disorders compared to the average. Indeed, in addition to the medical condition that might have caused the impairment, these people are at risk of diseases to which their impairments predispose them, and of conditions induced by the side-effects of their treatments. They also meet difficulties in access to care, limiting possibilities of screening, diagnosis and treatment. Poor health can be considered as a potential barrier in compensation strategies for pursuing normal activities. The aim of this study is to appraise the nature and magnitude of the excess risks of morbidity associated with functional limitations, in an overall and comparative perspective, using a population-based health and disability survey.

Method. We used data from the national health and disability interview survey, conducted in 2008 on a sample representative of private households. Self-reported information on health status, disability, prevention and health behavior was recorded. We focus on the population aged 18-59 to assess the health status and disability situation. In this study, we first defined homogeneous groups of people with functional limitations. Second we analyzed the association between the groups obtained and the reported diseases on the one hand, and symptoms (pain, lack of vitality, anxiety…) in the other. The homogeneous groups of functional limitations are ranked in a hierarchical classification using all the physical items, all the sensory items and all the cognitive and mental items. For each group : a) self-reported health, and number of reported diseases; b) we ran logistic regressions to assess the relative risk of reporting diseases; c) we ran logistic regressions to assess the relative risk of reporting symptoms; d) we ran logistic regressions to assess the association between social disadvantage and the reported symptoms.

Results. Among the 18-59 years old, 12% of men and 14% of women report functional limitations. The hierarchical classification distributed the population with physical limitations into 5 groups; those with sensory limitations into 3 groups; and those with cognitive and mental limitations into 4 groups. All these groups display more health problems than the average. The first regression model shows a strong association between these various groups and specific diseases. Among them, the groups with severe mental limitations (all mental/cognitive functions concerned) and physical limitations (all physical functions concerned) have the poorest self-reported health. Some of these associations clearly reflect the disablement process; other reflect causal relationships (ie decubitus ulcer with lower limb functional limitations); others reflect predisposition (cognitive/mental limitations with autism and epilepsy with Down's syndrome and Alzheimer's). The second regression model shows that functional limitation groups are associated with various psychological and mental symptoms. The third shows that the link between functional limitations and restriction in social participation is partly due to the associated pathological risks (diseases and symptoms).

Conclusion. This study highlights the need to account more fully for the health situation of people with impairments, as they have high levels of morbidity and symptoms which are not specifically related to the direct cause of their impairment. Specific attention should be paid to these symptoms which are liable to increase the risk of activity and participation restriction

Zachary Zimmer, D Gu///

Life Expectancy in States of Coresidence among Oldest-Old Chinese: An Alternative Application of IMaCh

Background. This paper uses the IMaCh method to compute number of years among those aged 80+ that are expected to be lived with and without a coresident adult child. China is one of many countries experiencing both rapid socio-economic change together with unprecedented rates of population aging. The combination of these phenomena is creating concerns regarding whether and how traditional family norms might change in ways that harm the well-being of older people. Of particular interest to social demographers is the long-standing custom of coresidence with an adult child. This practice is thought to represent the system of providing support for the oldest-old. But, recent research by one of the current authors has indicated that the oldest-old in China are characterized by relatively high rates of transitions in and out of coresidence, especially in the time just prior to death, and these transitions are further influenced by 'need' characteristics such as disability and widowhood (Zimmer and Korinek 2010). What this means for years remaining in various coresidence states has never been examined among this or any other population. Yet, high transition rates suggest the applicability of methods such as IMaCh to determine expected years in various living arrangement states.

Methods. Data come from four waves (1998, 2000, 2002, 2005) of the Chinese Longitudinal Healthy Longevity Survey (CLHLS). Data include post-mortality interviews, which allow for modelling of transitions in coresidence in the period just before death. IMaCh software 0.98 is employed to assess total life expectancy and expectancy coresiding with and without an adult child. Expectancies are further subdivided by sex, disability and marital status. Both population and status based results are examined.

Results. Preliminary findings indicate percent of remaining life in coresidence increases with age for both men and women, but this is highly dependent upon sex and originating state. At age 80, about ½ of a man's remaining 6.8 years of life are spent living with an adult child, compared to about 60% of a woman's remaining 8.0 years. By age 90, a man can expect to live an additional 3.6 years, 60% of which is in coresidence, compared to 67% of a woman's remaining 4.3 years. Further analysis will examine these results across baseline coresidence states and across disability and marital status characteristics. Additional analyses will estimate the bias in estimating years of coresidence that would occur if information prior to death were not recorded.

Conclusions. This study demonstrates the practicality of IMaCh specifically, and methods for determining healthy life expectancy generally, for demographic outcomes where high transition rates are likely. In the current case, given the aging of China, specific estimates of life spent in various states of coresidence are of import for predicting future formal and informal care needs and subsequently as a basis for policy.

Reference. Z. Zimmer and K. Korinek. 2010. Shifting coresidence near the end of life: Comparing decedents and survivors of a follow-up study in China. Demography, 47: 537-554.

Michel Guillot, Hyun Sik Kim///

Trends in healthy survival: a cohort approach

There remains a large amount of uncertainty about whether current increases in life expectancy are being matched by similar increases in healthy life. In recent decades, several hypotheses have emerged: (1) the expansion-of-morbidity hypothesis, which states that seriously chronically-ill individuals are being kept alive by medical interventions, creating increasing demands on health and social care systems while generating limited improvements in the well-being of the population; (2) the compression-of-morbidity hypothesis, which states that the average age at onset of disability increases faster than life expectancy, creating a decrease in the number of years spent with disability; and (3) the dynamic-equilibrium hypothesis, an intermediate hypothesis which states that when disability is defined as severe morbidity, the number of years spent with disability remains relatively constant as life expectancy increases.

These are conflicting hypotheses with important implications for the future costs of health and social care systems in low-mortality countries. In spite of the significance of this debate, current methodologies for testing these hypotheses are not entirely satisfactory. They are either of limited applicability because of high data requirements (the multistate method), or based on questionable assumptions (the Sullivan method). As a result, the research on compression vs. expansion of morbidity has not been fully conclusive. In this paper, we propose to contribute to this debate by estimating trends in healthy survival for cohorts. Specifically, we will follow successive cohorts of a given age, combining the survival probabilities of these cohorts (p) and their probability of being in "healthy" (Π).

Rather than jointly examining trends in life expectancy vs. healthy life expectancy, as commonly done, here we will jointly examine trends in p vs. pΠ at a given age for successive cohorts. Cases in which p is increasing more slowly than pΠ will indicate compression of morbidity, whereas cases in which p is increasing more quickly than pΠ will indicate expansion. The advantage of this approach is that the two pieces of

information (mortality and health) will be conceptually consistent, because they will both refer to actual cohorts. This is superior to the Sullivan method, which incorrectly combines information on real and synthetic cohorts. This is also superior to the multistate method which makes the strong assumption that the population by age and health status is homogenous with respect to the risk of death. We will apply this approach to data from various European countries available in the EHEMU database. Various measures of health status will be used, and uncertainty intervals will be calculated. Preliminary results for France indicate patterns of compression for females but patterns of expansion for males.

Beatriz Novak, A Palloni///

Subjective Survival Expectations and Observed Survival: What Makes them Different?

Background. It has become increasingly common in surveys that probe adult health conditions to elicit information about expected probabilities of surviving to certain ages and to use such information to relate to current health status, to labor force participation behavior and to retirement decisions. A potential use of this type of data which has been much less studied is to contrast expected and observed survival probabilities to assess overall differences between underlying mortality risks and those perceived by individuals. More generally, information on expected and observed mortality risks can be employed to establish the effect of external health shocks on updating self reported health status and conditions as well as potentially significant behavioral changes. The objectives of this paper are: (a) to estimate life tables and its functions from expected probabilities of surviving from individuals ages 50-70 to age 75, (b) to compare these life tables with those calculated from actual data, (c) to evaluate the differences between the two across ethnic and gender groups, (d) to assess the effect of self reported health status and health conditions on the estimated differences. Of particular importance to us are the patterns of differences across populations by obesity and BMI in general

Data and Methods. We use the US Health and Retirement Survey (HRS), from years 1992 to 2006, to retrieve information on individual expected survival. We then apply Non Linear Least Squares methods to estimate actual life tables from such expectations. We fit a range of mortality functions: Gompertz, Weibull, logistic and log logistic. We summarize information using the estimated parameters as well as selected functions from the associated life tables. We proceed analogously with actual life tables estimated from HRS and then employ the resulting estimates to compare with those retrieved from individual survival expectations.

Main Results. Preliminary results show that, even though relative to US life tables, males and females underestimate their life expectancies by as much as 10 years differentials between males' and females' life expectancies are similar for subjective and actuarial estimates. Differences between subjective and actuarial estimates for white males are also around 10 years. However, for black males differences are much smaller though their magnitude increases with age. We also find the so called "race anomaly" according to which black males expect to live longer lives more than white ones do. The anomaly occurs for males but not for females. Using mortality information retrieved from HRS itself (1992-2006) we find that actual male and female life expectancy at age 50 is higher among those overweight (25≤BMI<30), compared to those who are normal weight or obese. Even though life expectancy at age 50 among males in the obese body weight category is around 2 years less than among overweight individuals, obese individuals expect to live around 4 years more than their overweight counterparts. Actual life expectancy at age 50 among obese females is around 6 years less than among overweight females while subjective life expectancy among obese females is around 2 years higher than among overweight ones. Differences between actual life expectancy and subjective life expectancy are more noticeable among individuals in higher obesity levels. Interestingly, subjective life expectancy for both males and females in the overweight category is substantially lower than subjective life expectancy among normal weight individuals thus suggesting that the objective advantage of individuals of extreme weight does not influence their perceptions and expectations.

Conclusions. In general both males and females tend to underestimate mortality risks associated with high body weight levels. Obese individuals expect a longer life span than normal weight and overweight ones and the latter expect considerably higher levels of mortality than normal weight and obese individuals.

Xian Liu, C Engel///

Predicting Longitudinal Trajectories of Health Probabilities with Random-effects Multinomial Logit Model

Background. When analyzing longitudinal health data, researchers often encounter response outcomes characterized with three or more nominal categories. Random-effects multinomial logit models are generally applied to account for the potential lack of independence that exists in longitudinal data. This study attempts to go beyond existing work by developing a retransformation method that derives longitudinal growth trajectories of unbiased health probabilities from the random-effects multinomial logit model.

Methods. We use parameter estimates of the random-effects multinomial logit model to describe longitudinal health processes. Specifically, a new retransformation method is developed to account for random effects, both across and within individuals. The empirical application uses the longitudinal health data from the Asset and Health Dynamics among the Oldest Old (AHEAD). The analysis compares the predicted probabilities of three functional states at six time points, obtained from two random-effects multinomial logit models, one with retransformation of random errors and one without.

Results. The results demonstrate that neglect of retransforming random errors in a random-effects multinomial logit model will result in severely biased longitudinal trajectories of health probabilities.

Conclusions. Without retransforming random errors in performing a random-effects multinomial logit model, the predicted probabilities at each time point will be misspecified in turn resulting in serious prediction biases. Therefore, great caution must apply when using this complex regression model for analyzing longitudinal health data.

Kwok-hung Billy She///

Differences in health status and health expectancies by gender and geographical districts in Hong Kong

Background. Socioeconomic disparity has been a pressing issue in Hong Kong. Some districts, such as Tin Shui Wai and Sham Shui Po, have been claimed as depressed districts which have little economic activity and/or a concentration of poor and problematic households. However, studies on the influence of socioeconomic disparity by districts on the health status, as well as the health expectancies of elderly people are insufficient in Hong Kong. This study aims to employ a longitudinal approach to explore geographical variations in health status and expectancies among aged 65+ elderly in Hong Kong and to identify the socioeconomic and other risk factors that partially account for these variations.

Methods. This study used longitudinal datasets from the 18 Elderly Health Centres which are operated by the Department of Health. Respondents were those aged 65+ community-dwelling elderly members who first enrolled or re-visit the centres during the January 1, 2004 to December 31, 2004, and they were followed up till the end of 2008. Each respondent was firstly interviewed by trained nurses using the standardized questionnaire, which is used by the EHCs since 2004, and underwent clinical examination by the EHC doctors. The questionnaire records detailed information (such as personal particulars, health practice, medication, chronic diseases, ADL, IADL, and psychological problems) which provides abundant information for the analyses. Vital status and causes of death were ascertained by the DH from death registration or Hospital Authority specialist out-patient and hospitalization databases regularly. Health status and health expectancies by gender and districts are calculated by multistate life table method with the aid of IMaCH computer program.

Marioni, van den Hout, Venzuela, Brayne, Fiona Matthews///

Education, occupation, and late-life social engagement and their effects on cognitive impaired life expectancy

Increased cognitive reserve or cognitive lifestyle has been linked to a reduced risk of developing dementia. Three factors commonly included in measuring cognitive lifestyle are education, occupation, and social engagement. Here we aim to investigate their relative importance of each individual predictor in investigating cognitive impaired life expectancy.

Longitudinal data were analysed on 12,470 participants from the Medical Research Council Cognitive Function and Ageing Study. Subjects were aged 65 years and over and were followed up over a 16 year period. Cognition was assessed using the Mini-Mental State Examination, which was split into three groups (no impairment, slight impairment, and moderate to severe impairment). Multi-state models were used to test the associations between the cognitive lifestyle components and cognitive decline. In addition to forward transitions (cognitive decline) and transitions from all cognitive states to death, a back transition (cognitive recovery) was allowed from the slightly impaired state to the non-impaired state.

Higher educational attainment and a more complex mid-life occupation were associated with a reduced hazard of a transition from a non-impaired to a slightly impaired state, an increased chance of cognitive recovery from a slightly impaired state but an increased hazard of the transition to death from a severely impaired state. The effect of occupation was slightly attenuated upon adjustment for education. The association between social engagement and cognition was independent of educational attainment and occupation; more active individuals had a decreased hazard of the transition from a slightly impaired state to a moderately/severely impaired state. Compared to those in the lowest groups for all of the lifestyle variables, those in the highest groups had twice the estimated total life expectancy at age 65 and over 40% additional cognitive impairment-free life expectancy.

In conclusion, increased education, late-life social engagement, and a more complex occupation independently protect from cognitive decline, enhance the possibility of cognitive recovery, but accelerate the transition to death from severe impairment. These findings support the possibility that contributions to reserve can be made across the life-course and that these may affect cognitive change in later life.

Michael McFarland, M Hayward, D Brown///

Marital Biography and Health in Older Adulthood : Exploring the "Under the Skin Processes"

Background. Although recent research documents the importance of marital biography for the health of older women and men, much less is known about “under the skin” processes that may mediate these associations.

Methods. Here, we use data from the 2005/2006 National Social Health and Aging Project (NSHAP) and the 2006 the Health and Retirement Survey (HRS) to assess marital biography’s association with three major types of physiological risk (cardiovascular, metabolic, and cumulative). By employing negative binomial regressions, we test how three dimensions of marital biography (i.e. current marital status, number of marital disruptions, and cumulative decades married) are associated with biological risk among women and men aged 57-75.

Results. Preliminary analyses reveal that women’s marital duration was protective of cardiovascular, metabolic, and cumulative biological risk. Moreover, the influence of marital duration interacted with current marital status such that increased marital duration among remarried females was associated with increased biological risk. The reverse pattern was found among males such that marital duration was associated with less biological risk among the remarried.

Conclusion. This research fills a gap in the literature by connecting how marital biography is related to different biological systems and how these relationships vary by gender. Preliminary analyses reveal a complex pattern in which remarriage is beneficial for men but harmful for women.

François Herrmann///

Longevity, intelligence and education

Background. Cognitive epidemiology is a developing field looking at the association between intelligence, personality traits, diseases and survival. It relies on the analysis of large data sets dealing with the long term follow-up of subjects who had a previously recorded cognitive assessment.

Methods. We reviewed and discuss the definitions and the available literature. Among the many intelligence tests available the Wechsler Intelligence Scale for Children (WISC) and the Wechsler Adult Intelligence Scale (WAIS) are the most frequently used to obtain intelligence quotient (IQ) scores after standardization for age.

Results. Intelligence scores assessed in adulthood have been shown to be associated with longer life span, but adult assessment provides less evident clues as it can be altered by morbid conditions. This association could be mediated by education which is known to be correlated with improved survival. Reverse causality, bias and confounding could also explain this association. Some data regarding gender differences will also be presented.

Conclusions. The link between childhood cognitive performances and survival seems stronger as it is observed in different time periods, nations, and populations, but the underlying mechanisms are still unclear and might involve genetics, socio-economical background, education and healthy behavior. The application of this review to an ongoing research project will be discussed.

Mikkel Baadsgaard, H Brønnum-Hansen///

Social inequality in life expectancy increases in Denmark.

Background. The aim was to estimate and compare trends in social inequality in life expectancy based on different social stratifications.

Methods. Life tables by sex and various levels of education and income were constructed for each year in the period 1987-2009 by linking data from nationwide registers comprising information on all Danish citizens on date of birth, date of death, education and income. Trends in life expectancies were compared for different categories of social grouping of the population.

Results. When categories of educational level were kept fixed, implying a decreasing proportion of persons with a short education, the educational inequality in life

expectancy increased. Thus, the difference in life expectancy at age 30 between unskilled male workers and men with higher education increased from 2.6 years in 1987 to 3.9 years in 2009. For women the difference increased from 1.5 years in 1987 to 2.6 in 2009. A similar growing social inequality was observed when educational level was based on quartiles established from prescribed length of education. A considerable increasing inequality was reached for men when the population was divided in quartiles of equivalent disposable income, whereas the change was only modest for women.

Conclusions. During the past 20 years, the social gap in life expectancy has widened in Denmark. This conclusion was not affected by the changes of the social compositions of the population.

Marti Parker///

Gender differences in LE without joint pain at age 65

Background. Reported joint pain increased between 1991/92 and 2000/02 among people aged 65+. Pain among women increased from 39 to 49%; for men from 25 to 33%. Life expectancy (LE) at age 65 increased from 20 to 20.6 years for women, and 15.9 to 17.2 for men. This study estimates LE at 65 without joint pain (pain-free LE, PFLE) in 1991/92 and in 2000/02. Has PFLE changed over ten years? And has the change been different for women and men?

Methods. We use two population-based interview surveys (LNU and SWEOLD) with identical questions about pain. PFLE was calculated using Sullivan's method combining prevalence rates of reported pain and life tables from Statistics Sweden. The pain index included items of mild or severe pain in shoulders, back and limbs. The index was dichotomized to distinguish those persons who reported at least three mild pains or one severe.

Results. In 1991/92 both men and women aged 65 could expect to live without joint pain for 12 years. Ten years later, women at 65 could expect 10.6 years without pain, men 11.7. Years with pain increased, so that that the proportion of PFLE for women went from 60 to 51% and for men from75 to 68%.

Conclusions. The estimated proportion of LE at 65 without joint pain decreased between 1991/92 and 2000/02.

Madelin Gomez Leon, E M León Díaz///

The sex gap in life expectancy and healthy life expectancy in Cuba

Life expectancy differs markedly between sexes, depending on the evolution of mortality patterns of men and women. This sex differential has been increasing in favour of women during the last 20th Century with around 5 to 8 years more of life expectancy for women in the developed world. Nevertheless, some of these countries experienced a reduction or stagnation of this indicator by the end of the Century, which leads us to some questions regarding this issue: Could also developing countries experience this trend of increasing life expectancy and a stagnation or decline in the sex differential? Who is the responsible for this decline, is it because men are doing better and catching up the women in terms of survival, or is it because women are worsening theirs?

The paper analyzes a developing country such as Cuba, who experienced an increase in the life expectancy but none rise of the sex differential like it has been observed in most of the developed countries. A question arises to our minds: Who is the responsible for this pattern of the sex differential in Cuba, is it because men are doing better and catching up the women in terms of survival, or is it because women are worsening theirs? Given the increasing importance of mortality at older ages to the improvements in life expectancy, we will also explore for the same period of analysis, what had happened in the sex differential after age 60, and the contributions of the main causes of death.

Data of population and specific death rates by sex in yearly basis published by National Statistic Office and Public Health Ministry of Cuba will be used. We will apply the decomposition method (Shkolnikov, Begun and Andreev, 2001) to determine the role of age and cause specific-death rates over the differences observed between sexes in the life expectancy and in two periods in time, from 1986 to 1996, and 1996-2006.

Sandra Reynolds///

Gender Differences in the Impact of Obesity and Physical Activity on Active Life Expectancy

Background. Gender differences in the impact of obesity on active life expectancy are well-established, with obese women living the longest with ADL disability. Gender differences also exist in the propensity to engage in vigorous physical activity. The purpose of this study is to examine the role of physical activity in mediating the effects of

obesity on active life expectancy and whether we observe similar mediating effects for US men and women

Methods. The data for this study come from the RAND recode of the first eight waves of the Health & Retirement Survey (HRS), spanning the years 1992 through 2006. Using multistate life table (MLST) methods as the basis of its estimations, the Stochastic Population Analysis of Complex Events (SPACE) program has several advantages over other programs, including the use of micro-simulation and the bootstrap method to estimate the variance of MSLT functions.

Preliminary Results. For ages 50-59, for example, total life expectancy with and without obesity is 28.0 and 28.9 years for men; these differences are not statistically significant. Active life expectancy, however, ranges from 22.8 for obese men to 25.4 years for non-obese men. In contrast, when physical activity is taken into account, total life expectancy for active men is between 42.4 and 42.9 years (obese vs. non-obese), where non-active men have total life expectancy of 26.1 and 26.7 years (obese vs. non-obese). Active life expectancy for active men ranges from 34.6 to 38.2 years (obese vs. non-obese), where non-active men can expect to live between 20.3 and 23.1 years free of disability (obese vs. non-obese). In all cases, both total and active life expectancy is 2-3 years longer for 50-59 year old women and the same relationship between obese and physical activity is observed

Conclusion. Obesity again appears to have little relationship to total life expectancy; lack of physical activity lessens total life expectancy, and both obesity and lack of physical activity decrease active life expectancy by 4 years and 14 years respectively. Increasing physical activity appears to have the potential to mitigate the disabling effect of obesity in older adults.

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