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Joint Eurostat-UNECE Work Session on Demographic Projections
(Bucharest, 10-12 October 2007)

REPORT

Note by the Secretariat

I. Introduction

1. The Joint Eurostat-UNECE Work Session on Demographic Projections was held in Bucharest, Romania, on 10-12 October 2007 at the invitation of the National Institute of Statistics of Romania. The Scientific Committee was composed of Ms Graziella Caselli (University of Rome "La Sapienza"), Mr Vasile Ghetau, (University of Bucharest), Mr Nico Keilman (University of Oslo), Mr Wolfgang Lutz (International Institute for Applied Systems Analysis (IIASA) and Vienna Institute of Demography (VID)) and Mr Frans Willekens (Netherlands Interdisciplinary Demographic Institute (NIDI)).
2. The meeting was attended by about 80 participants from National Statistical Institutes, demographic research institutes, universities, and other institutions representing the following countries: Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Oman, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, The former Yugoslav Republic of Macedonia, Turkey, and United Kingdom. The UNFPA Country Technical Services Team (CST) Bratislava was also represented.
3. Opening statements were made by Mr. Vergil Voineagu, President of the National Institute of Statistics of Romania, Mr Attila-Zoltan Cseke of the General Secretariat of Government, Mr. Stefan Bodgan on behalf of the Minister of Health of Romania, Mr. Michel Glaude, Director for Social Statistics and Information Society at Eurostat, and Mr. Paolo Valente of the UNECE Statistical Division.

4. Mr. Vergil Voineagu (Romania) was elected Chair of the meeting, and Mr. Nico Keilman (Norway) was elected Vice-Chair.

5. Two keynote lectures were given by Mr. David Reher (University of Madrid) on “Towards long-term population decline: Views at a critical juncture of world population history” and by Mr. Henri Bogaert (Federal Planning Bureau, Belgium) on “Long Term Population Projections in Europe: How they influence policies and accelerate reforms”.

6. The following study topics were considered in special sessions at the meeting:

- Session 1: Fertility (Session Chair: Wolfgang Lutz, IIASA – VID)
- Session 2: Mortality (Session Chair: Nico Keilman, University of Oslo)
- Session 3: Population projections (Session Chair: Graziella Caselli, Università di Roma "La Sapienza")
- Session 4: Household projections (Session Chair: Vasile Ghetau, University of Bucharest)
- Session 5: Specific projection issues (Session Chair: Frans Willekens, NIDI)
- Closing session: Round table discussion on “Uncertainty of future population trends in Europe and outside: Is it a question for demographers, decision – policy makers or both?” (Chair: Frans Willekens, NIDI)

7. In total 25 working papers were presented and discussed in the different sessions. The working papers are available on the UNECE website at the following address:

<http://www.unece.org/stats/documents/2007.10.projections.htm>

8. The presentations and discussions were of high quality and relevance to the major research and policy questions related to demographic projections. The main outcomes of the discussions in the various substantive sessions are presented in the next section of the report.

II. Summary of the discussions

9. The main points that emerged from the discussions in the substantive sessions are summarised below.

- Session 1: Fertility (Session Chair: Wolfgang Lutz, IIASA – VID)

10. The common aspect of the presented works was the life-course approach. However, it was noted that for this kind of approach it was more difficult to take into consideration influencing variables that operate at aggregate level, like the female employment conditions.

11. Data requirements were considered another element of concern of the life-course approach. Nevertheless, it was shown that, in certain cases, these requirements can be minimal and that this approach allows for further improvements of the results, producing more realistic views, if more data are available.

12. Certain assumptions can raise a problem of public and/or political acceptance. It was questioned whether policies can – or even should - do something in the fertility domain. The experience at European Union level shows that there is a growing interest in the policy issues of demography, and international expert groups have been set up in the European Commission to discuss these topics.

13. It was noted that the possibility of very low fertility should also be reflected in the assumptions, including the risk of falling in a "fertility trap", due to a negative population momentum. Moreover, in these cases, implicit assumptions of important societal changes are in fact embedded. However, as these changes are supposed to occur slowly, they are often perceived as less dramatic although they have great long-term impacts.

14. Educational level was recognised to be an important driver for fertility, as well as the labour participation rate. However, it was remarked that these variables were not the most appropriate for policy purposes, as increases in fertility would then appear only possible by worsening the achieved level of education or labour participation. It is therefore important to understand the drivers of fertility more comprehensively and to identify at the same time appropriate levers for policy purposes.

- Session 2: Mortality (Session Chair: Nico Keilman, University of Oslo)

15. The inconsistencies that could occur with the Lee-Carter model were highlighted. In particular, it was noted that changes of the pace of improvements of the age-specific mortality rates would not be properly taken into account. These inconsistencies would occur regardless of the version of the Lee-Carter model used (i.e., the basic version or some of its variants).

16. It was discussed if the proposed correction for consistency to the Lee-Carter model could benefit from more complex techniques, including "limit mortality tables". However, these approaches appear not to fit with the overall philosophy of the proposed correction mechanism. Sensitivity to the observation period and, in particular, the base year to be used for the estimation is still considered to be a major point.

17. In linking the life expectancy evolution to pension schemes, the importance to acknowledge the differentials in mortality by socio-economic groups was remarked, especially given the current tendency of the differentials to increase between groups. Also, aspects like transfer of pension to the surviving spouse or deflation mechanisms (defining a "discounted" expected number of years after retirement) need to be considered in this kind of policy-related models.

18. The increasing importance of the oldest old make it necessary to properly estimate their mortality rates, and the best performing model could be different depending on the country. It was discussed whether, in the latest proposal (Debut-Goderniaux model), extensions could be considered that try to make endogenous the maximum age, or to model the dynamics of the parameters.

- Session 3: Population projections (Session Chair: Graziella Caselli, Università di Roma "La Sapienza")

19. Certain assumptions can produce projections results that seem to be implausible or of difficult social sustainability, like high rates of childlessness, or old age dependency ratios, etc. Especially in case

of results that may be difficult to accept by some users, care should be taken to ensure full consistency of the results; for instance, in presence of high childlessness, 2-sexes marriage market models should be considered. However, it was remarked that apparently “difficult results” could well be the output of very detailed assumptions models, and that certain “implausible” rates were already experienced in specific population groups. The purpose of the projections could also be to push policy-makers to the action.

20. The use of micro-simulation models poses particular methodological challenges and opens rich possibilities for modelling. It was questioned whether the uncertain time trends in the rates were properly taken into account in these models. It was also noted that, in a state-space context, besides the entry in the state and the frequency of the changes, it is appropriate to take into account the duration in the state, since the duration is an important element for the use of these models in policies. The performance of the simulation program, i.e. the time necessary to run the program or the size of the internal memory it requires, can be another relevant element when simulation of this type is evaluated.

21. It was underlined that the presented micro-simulation models were developed paying particular attention to their transparency and to the possibility of modelling with very detailed assumptions. Dealing with phenomenon at the individual level allows discovering different perspectives and may help to explain apparent paradoxes at the aggregate level. Reference was also made to similar experiences existing in Canada.

- Session 4: Household projections (Session Chair: Vasile Ghetau, University of Bucharest)

22. The influence of marital status on households in the dynamic models was questioned. It was noted that living arrangements are probably more important in the household composition than marital status, and, therefore they should be included in the model before marital status, not following, as the actual behaviour of individuals is easier modelled in terms of living arrangements, than in terms of formal marital status.

23. The extension of probabilistic household projections to include fluctuation of the transitions was considered to be not rewarding, given the complications that this would cause for the estimation of the covariances.

24. The role of household projections in the context of projections exercises was discussed. One view is to interpret household projections as a kind of “general purpose” projections. One may also view them as *ad-hoc* projections for specific users needs. In any case, working closer with the users of household projections was suggested as good practice.

25. The projections of the distribution of households by size was mentioned as having new dimension in the context of the increasing population ageing in developed countries, for better housing and urban planning as well as for decisions involving long-term public and private expenditures.

- Session 5: Specific projection issues (Session Chair: Frans Willekens, NIDI)

26. The importance of appropriately defined geographical units for the purposes of small-area projections was discussed. While the usual administrative areas may not be the optimal territorial

breakdown, nevertheless they are an unavoidable geographical reference, as small-area projections are mainly used for planning purposes by the local authorities.

27. It was noted that the identification of small areas in terms of functional criteria can be welcomed. A specific system of data production based on these areas would need to be set up, as currently there are no data usually available for this kind of breakdown.

28. The adoption of Bayesian methods with prior distributions to forecast migration was suggested as a possible solution when only small samples are available. It was shown how the choice of the model was in fact not much affected by the use of the prior distribution, and therefore *a-priori* information has not a strong influence; however, such an influence increases when samples become smaller. Still, sensitivity analysis should be performed to test the robustness of the Bayesian approach against changes in the definition of migration.

29. It was noted that models which try to extrapolate the time series of the variance (ARCH or GARCH models) may produce less satisfactory results for the prediction intervals. It was concluded that, while they have larger application in the financial and economic domains, these models are less suitable for the migration and, more in general, demographic projections purposes.

30. In the projections for population sub-groups (ethno-cultural, religious, etc.) there is the possibility to take into account demographic differentials. This may raise problems of data availability and quality, especially for the category of migrants, and it was noted that extensive checks can be done using census or large-sample data (e.g., from labour force survey, health survey, etc.) or registers.

31. It is very likely that the explicit consideration of the increasing weight of specific sub-population groups meet the interest of policy makers. Changes in the composition of the resident population have indeed large consequences for a number of policy issues, like health, education, etc. Projections results could also be provided for sub-groups of persons born in the country.

- ROUND TABLE DISCUSSION "Uncertainty of future population trends in Europe and outside: Is it a question for demographers, decision – policy makers or both?" (Chair: Frans Willekens, NIDI)

32. Uncertainty is clearly a question for both demographers and policy-makers. Demographers should produce projections with a degree of uncertainty, but they have also the responsibility to explain to the users how to understand the projections. At the beginning, this effort may take some time to produce results, but it should be rewarding in the long-term.

33. Communication and education emerged as very important elements. Demographic developments often take place over a long time, and this lack of urgency, together with a usually shorter term of the policies, can be the cause of policy inaction. It is responsibility of the demographers, both in research institutes and in the national statistical offices, to find the more efficient way to pass the relevant messages. The dialog between demographers and policy-makers should be continuous, as this has certainly a positive effect on both sides.

34. Projections can be used not only for pension reforms, health and education planning, etc., but also to highlight the possibilities of intervention on the demographic developments. Background studies on the demographic drivers may therefore also be interesting for policy-makers.

35. The collaboration with experts from other fields is a relevant element to increase the impact of demographic analysis and projections. Taking into explicit consideration socio-economic factors affecting demographic developments will contribute to the comprehension of the messages from demographers and will likely improve the performance of the models.

III. Publication of the proceedings

36. Eurostat will take the responsibility for publishing the proceedings of the meeting.

IV. Recommendations for future work

37. The meeting was informed that the Conference of European Statisticians recommended the preparation of a collection of documented practices on population projections.

38. The meeting approved the preparation of a collection of documented practices on population projections, and the creation of a Task Force for this purpose. The UNECE and Eurostat will contact member countries to identify potential candidates to work in the Task Force.

39. The meeting proposed that a similar work session would take place in the beginning of June 2009 in Cyprus.

V. Concluding remarks

40. The participants expressed their appreciation and gratitude to the National Institute of Statistics of Romania for the excellent facilities and support provided for the meeting and for the social program offered to the participants. They also expressed appreciation to the members of the Scientific Committee for the topical assistance and the inputs that they had made to the meeting.
