United Nations ECE/CES/GE.22/2018/2

# Economic and Social Council

Distr.: General
28 June 2018

Original: English

## Economic Commission for Europe

Conference of European Statisticians

### Group of Experts on Consumer Price Indices

**Fourteenth session**
Geneva, 7 – 9 May 2018

# Report

*Summary*

The present document is the report of the meeting of the Group of Experts on Consumer Price Indices, 7-9 May 2018, and is provided to inform the Conference of European Statisticians of the organization and outcomes of the meeting.

The Conference of European Statisticians at its sixty-fifth plenary session plenary session in June 2017 approved the UNECE Statistical Programme 2017 (document ECE/CES/2017/14). The Statistical Programme includes in Annex I the list of meetings planned to be organized from January 2017 to June 2018. The list includes the meeting of the Group of Experts on Consumer Price Indices to be organized in Geneva in May 2018.

GE.18-10649(E)

*1810649*

Please recycle

# I. Introduction

1. The Meeting of the Group of Experts on Consumer Price Indices (CPI) jointly organised by UNECE and the International Labour Organization (ILO) was held in Geneva on 7-9 May 2018. The meeting was attended by representatives of Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bermuda, Bosnia and Herzegovina, Brazil, Burundi, Cameroon, Canada, China, Colombia, Croatia, Denmark, Dominican Republic, Estonia, Finland, France, Georgia, Ghana, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, Japan, Kazakhstan, Kuwait, Kyrgyzstan, Latvia, Liberia, Lithuania, Luxembourg, Malta, Mexico, Mongolia, Montenegro, Morocco, Netherlands, New Zealand, Norway, Peru, Philippines, Poland, Portugal, Republic of Moldova, Russian Federation, Saudi Arabia, Serbia, Singapore, Slovenia, South Africa, Spain, State of Palestine, Sweden, Switzerland, Tajikistan, Thailand, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United States of America, Uzbekistan, Viet Nam and Zimbabwe.

2. Representatives of the following organisations attended the meeting: European Central Bank (ECB), Eurostat, European Free Trade Association (EFTA), International Monetary Fund (IMF), International Labour Organization (ILO), Interstate Statistical Committee of the Commonwealth of Independent States (CIS-STAT), Organisation for Economic Co-operation and Development (OECD), United Nations Interim Administration Mission in Kosovo (UNMIK), the World Bank and Fundação Getúlio Vargas, Brazil. Paul Armknecht, Professor Erwin Diewert, University of British Columbia, David Fenwick, Brian Graf and Professor Tsutomu Watanabe, University of Tokyo, attended the meeting as invited experts.

3. The meeting was chaired by James Tucker, United Kingdom, Office for National Statistics. The sessions of the meeting were chaired by Corinne Becker-Vermeulen and Hans Markus Herren, Federal Statistical Office of Switzerland, Patrick Kelly, Statistics South Africa, Helen Sands, United Kingdom, Office for National Statistics, David Friedman, United States, Bureau of Labor Statistics, and Lars Svennebye, EFTA.

# II. Organization of the meeting

4. The meeting was organised in the following sessions:

(a) New data sources

(b) Poster Session I

(c) Services in the CPI

(d) Methodological issues in CPI compilation I

(e) Methodological issues in CPI compilation II

(f) Poster Session II

(g) Understanding and meeting different user needs

(h) Updating of the 2004 CPI Manual

(i) Panel session: Looking back and future challenges in CPI

(j) Future work

(k) Special Session for countries of East Europe, Caucasus and Central Asia

5. The meeting was prepared by the UNECE Steering Group on Consumer Price Indices comprising experts from France, Georgia, Italy, Mexico, Netherlands, South Africa, Switzerland, United Kingdom (Chair), United States of America, Bureau of Labor Statistics, Eurostat, CIS-STAT, ILO and OECD.

6. The main outcome and conclusions of the sessions are summarised in section IV of this report. Proposals for further work is provided below in section III.

7. The proceedings of the meeting, including this report, are available from the UNECE website www.unece.org/index.php?id=46772

# III. Proposals for further work

8. The participants of the meeting recommended that a meeting of the Group of Expert on Consumer Price Indices should be organised in 2020 and included in the programme of work of the Conference of European Statisticians (CES). The following topics were suggested for possible inclusion on the agenda of the meeting in 2020:

**New data sources**

9. This topic would involve discussion of big data, scanner data and administrative data, and combination of such data sources; particular problems in relation to services; collecting data from large multinational enterprises (e.g. Amazon, Ali Baba); sharing of experiences with software; and discussion of quality assurance and quality frameworks for new data sources.

**Digital and sharing economy**

10. There is growing interest in measuring the digital and sharing economy, which play an increasing role in many countries. What are the conceptual and measurement problems – what is the digital economy and what is the shared economy? In which way should digital products be included in the CPI, and how to estimate their weight?

**CPI and measurement of welfare and well-being**

11. Measures of welfare/well-being attracts much interest from policy makers, media and the public at large. What is the role and the limitations of the CPI in measuring welfare/well-being? Sharing of practical experiences in countries. It may be useful to invite experts from other areas of official statistics, e.g. national accounts, to discuss measuring welfare and well-being and the digital and sharing economy.

**Quality adjustment methods**

12. Adjustments for quality changes of goods and services is one of the main challenges in CPI compilation. Different strategies (frameworks) and practical methods to adjust for quality changes should be shared.

**Methodological issues**

13. Methodological topics in relation to the production of the CPI would include issues such as sampling and data collection, index calculation formulas, treatment of missing items and their replacement and seasonal products.

**Understanding and meeting user needs**

The discussion at the meeting showed large interest in how to meet different user needs and how to produce CPIs for different purposes. What are the specific calculation issues e.g. on weighting or coverage, and how do develop and maintain a coherent and efficient system of

CPIs? What are the challenges and good practices in disseminating different CPIs to the users and the public at large?

14. A special session for countries with economies in transition should be organised to address issues of particular importance to countries of East Europe, Caucasus and Central Asia and other interested countries.

15. Countries and organisations that would like to contribute to the CPI Expert Group meeting in 2020, e.g. by organising sessions or submitting papers or presentations, were encouraged to contact the UNECE Secretariat.

# IV. Summaries of main discussions and conclusions

## A. Session 1: New data sources

Session chair: Corinne Becker-Vermeulen, Switzerland

16. The session was based on papers and presentations by United Kingdom, Belgium, Viet Nam, Norway, Portugal and Japan. The following main points and conclusions were raised during the session:

17. Digitalization in terms of scanner data and big data opens a variety of possibilities for CPI compilation. It was found promising to see more countries doing research on scanner data and web scraping methods and applying these in practice. This also includes studies to apply scanner data in new areas with more product replacements (e.g. sports equipment) to gain experiences in extending the use of scanner data.

18. Obtaining expenditure weights for web scraped prices continue to be a challenge, and there is no obvious way of obtaining this information. More research and practical experience in this area would be useful.

19. Countries may develop in-house software or buy this from a provider of software for web scraping. Both ways have their advantages and disadvantages that countries must consider.

20. While there are different practical experiences in countries, there is a need for developing theoretical and conceptual frameworks around scanner data and big data, for instance to ensure consistency in coverage or in the treatment of replacements. It was also pointed out that there is no generally agreed quality assurance framework developed particularly for web scraping or scanner data.

21. NSOs need to consider the pros & cons of scanner data and big data. The development and implementation of scanner data and big data require substantial resources but also offers opportunities in terms of replacing costly surveys, better coverage (at least for some product groups), improved timeliness and, eventually, better quality of the CPI.

22. Scanner data and big data offer opportunities to both countries with developed statistical systems and countries with less developed statistical systems. Methodological and technical support to countries with less developed systems would be very valuable. Countries were encouraged to share experiences and good practices in using scanner data and big data and it should be kept on the agenda of the CPI Expert Group meetings.

## B. Poster Session I

23. The session included presentations of country experiences and good practices in CPI compilation. The following countries and organisations provided poster presentations:

Australia, Denmark, Kazakhstan, Luxembourg, Mexico, Switzerland, Uganda, United States – Bureau of Labour Statistics, Eurostat and OECD. The presentations covered: web scraping for the CPI; quality adjustment methods for cars; introduction of scanner data for CPI compilation; sampling; open source survey app for tablet or desktop for price collection; price indices for new vehicles; classifying scanner data according to COICOP; and decomposition of annual inflation.

## C. Session 2: Services in the CPI

Session chair: Patrick Kelly, Statistics South Africa

24. The session was based on papers by Australia, Canada, New Zealand and Sweden. The following main points and conclusions were raised during the session:

25. Shared economy services become more and more important and were discussed in detail. Households consumption expenditures on shared economy services are in scope of the CPI and should in principle be covered by the CPI. However, in practices there are a range of measurement problems, including how to estimate their weights in the CPI and it may be difficult to identify and follow the (quality adjusted) price of some shared economy services.

26. Timeliness is also an issue. Shared economy services may emerge quickly and often NSOs will only be able to incorporate the services into the regular CPI with a considerable delay. This may raise criticism of the CPI of being dated, and may potentially also lead to bias in the CPI.

27. Information of some types of services may be available from administrative registers, for instance in the areas of transport, housing, health or social protection. In addition to scanner data and big data, future work on data sources should also address the use of administrative data sources, which may offer possibilities of (free) access to large data sets that can be utilised for CPI compilation.

## D. Session 3a: Methodological issues in CPI compilation

Session Chair: Hans Markus Herren, Switzerland

28. The session was based on papers and presentations by Australia, Georgia, United States, Bureau of Labor Statistics, OECD, and Erwin Diewert, University of British Columbia. The following main points and conclusions were raised during the session:

29. The measurement of upper-level substitution bias is complicated by the fact that most CPIs are based on annual weights while prices are recorded on monthly basis. Hence, the CPI measures the monthly changes in the price of buying the same annual basket. It would be useful with more analysis and estimates of upper-level substitution bias and to develop a generally agreed method for measuring this kind of bias.

30. The digital economy raises both conceptual issues and practical measurement problems. The digitalised economy offers some services for free (or without any explicit payment) that previously had to be purchased and completely new services that did not exist in the past. The availability of such digitalised services impacts the cost of living and – in a larger context – the quality of life of many households.

31. It is not clear, however, if or how digitalised services provided for free or completely new digitalised services should be included in the regular CPI, or whether it would be more feasible to try to capture such effects in a separate CPI that would be suitable for measuring the cost of living and could be used in studies of well-being.

32. Calculating the effects of products (services or goods) provided for free or completely new products will require estimation of reservation or shadow prices which require some assumptions about consumer behaviour and the functioning of the market, which may not always be fulfilled. Hence, estimates of such effect will be associated with considerable uncertainty.

33. From policy makers and users in general there is a large interest in the digital economy and the effects of the digitalisation, including on welfare. It was concluded that the CPI Expert Group should keep the digital economy and measuring of well-being on the agenda of its meetings.

## E. Session 3b: Methodological issues in CPI compilation

Session Chair: Helen Sands, United Kingdom

34. The session was based on papers and presentations by Ireland, Turkey and Eurostat. The following main comments and conclusions were raised during the session:

35. Adjusting for quality changes continues to be a main challenge in the compilation of the CPI. Different methods for both implicit and explicit quality adjustments are available. One conclusion seems to be that there is no single method that can be expected to give good results in all cases. Another key challenge in compiling the CPI is the treatment of seasonal products that are not available throughout the year. There is, also in the area of seasonal products different methods available, that countries may apply.

36. When applying methods for quality adjustment or seasonal products also resource implications need to be taken into account. This may, in particular, be an issue for small CPI teams with very few staff resources that may need to select methods than can be maintained with a limited amount of work. In general, statistical offices needs to allocate the resources in a way that maximises the quality of the CPI.

37. Before applying methods for quality adjustments or seasonal products it is recommended to review different methods and test whether the chosen ones provide suitable results and are not subject to systematic errors or bias.

38. Future work on quality changes and seasonal products should discuss and test different methods available with a view to develop internationally agreed good practices.

## F. Poster Session II

39. The session included presentations of country experiences and good practices in different areas of CPI compilation. The following countries and organisations provided presentations: Burundi, Canada, Finland, Netherlands, Russian Federation, Sweden, Thailand and Trinidad and Tobago. The presentations covered different topics, such as methods and practices for applying scanner data, including issues related to bias and the treatment of re-launches; integration of different data sources for the production of the CPI; and the treatment of replacements.

## G. Session 4: Understanding and meeting different user needs

Session chair: David Friedman, United States, Bureau of Labor Statistics

40. The session was based on papers and presentations by Netherlands, South Africa, United Kingdom, United States, Bureau of Labor Statistics and ECB. The following main comments and conclusions were raised during the session:

41. To meet user needs some statistical offices have started publishing a range of inflation measures, covering e.g. households' consumption but also areas such as production, fixed assets and capital markets.

42. Different versions of the CPI may be published, for instance some meant for inflation measurement, others for measuring the general development in the cost of living, or CPIs for different population groups, the poor, for instance. The development of CPIs for different household or income groups may be particular important in light of the growing interest in poverty and welfare measures.

43. The statistical office must be careful in disseminating and explaining the indices to the public to avoid misunderstandings or misuse. New tools or ways of presenting the indices should be considered to this end. Where more CPIs are published the different versions should be clearly delineated and explained, including also their intended use.

## H. Session 5: Update of the 2004 CPI Manual

44. IMF and Brian Graf (editor) informed about progress of work on updating the 2004 CPI Manual. The manual is being updated by a Technical Expert Group led by IMF, under the auspice of the Intersecretariat Working Group on Price Statistics (IWGPS). The main purpose of the update is to reflect methodological and practical developments over the previous decade, evolving user needs, and to provide clear and more prescriptive recommendations where possible.

45. Draft updates of the chapters are available from the website: https://www.imf.org/en/Data/Statistics/cpi-manual, where also a form for providing comments can be found. There will be a formal consultation with countries before submitting the finalised manual to the UN Statistical Commission for endorsement.

## I. Panel Session: Looking back and future challenges in CPI

Session chair: James Tucker, Office for National Statistics, United Kingdom

46. The session was organised to mark the 40th anniversary of the CPI Expert Group, who had its first meeting in 1978.

47. Valentina Stoevska gave a presentation of the past 100 years of history of official CPIs which were first developed during World War I. The first ILO resolution about cost-of-living indices were adopted by the 1925 International Conference of Labour Statisticians. This resolution was revised in 1947, 1962 (when the term CPI was introduced), 1987 and 2003. In 1989 the ILO published the ILO Manual on CPI which was replaced in 2004 by the Consumer Price Index Manual. Theory and Practice, that was developed under the auspice of the IWGPS.

48. David Fenwick in his presentation gave an overview of the work of the CPI Expert Group over the previous 40 years. He underlined the importance of the Expert Group as a forum for exchanging experiences in CPI compilation among national statistical offices and promoting the development and implementation of good practices. He also highlighted the impact of the Expert Group in the development of international recommendations on CPI compilation. For instance, the recommendation to revise the 1989 ILO manual on CPI was made at the CPI Expert Group meeting in 1997.

**Panel discussion**

49. The panel was organised to discuss what will be the main challenges of national statistical offices in compiling and disseminating the CPI in the next decade. The panel consisted of the following experts:

Levan Karsaulidze, *National Statistics Office of Georgia*
Erwin Diewert, *University of British Columbia, Canada*
Randi Johannessen, *Statistics Norway*
David Fenwick, *invited expert*
David Friedman, *Bureau of Labor Statistics, United States*

50. During the panel discussion the following points and conclusions were made:

51. For countries with less developed statistical systems core compilation and methodological issues, e.g. on quality adjustments, seasonal products and replacements, are key challenges due to lack of resources and expertise. Sharing of experiences and best practices will be useful for this group of countries. Harmonisation programmes, such as those of the European Union or the East African Community Partner States, can facilitate sharing of experiences, development of good practices and improve international comparability. In the short-term a major challenge may be to meet the expectations of users created by the existence of new approaches and the availability of electronic data sources. These expectations may be difficult to meet because of lack of resources and expertise.

52. To address the needs of countries with less developed statistical systems they should be encouraged to participate in international work, such as e.g. the meetings of the Expert Group on CPI, and to increase their input and participation on the agenda of international meetings. Other measures include capacity building activities such as training and regional workshops. In the longer term, sufficient funding is needed.

53. Scanner data is becoming more and more relevant for many countries as a feasible data source for the CPI. Advances can be made by applying a gradual approach beginning with the less complicated groups of products to gain practical experiences on how to use scanner data and integrate it into the regular CPI. Scanner data provides significant opportunities, also to countries with less developed statistical systems. Hence, it is important to share experiences and good practices among countries. Existing guidelines, such as provided by e.g. Eurostat, are also useful to refer to.

54. The digital economy poses many conceptual and measurement challenges but also new opportunities for CPI compilers. New techniques as machine learning and data science will be needed to utilise the waste amount of electronic data available on the web, without compromising the quality of the official CPI. As a side-effect new and more popular jobs will have to be created, making the NSO more attractive as an employer.

55. The 2004 CPI manual lists six main areas of concern with CPIs. The first concern is that regular CPIs are not true Laspeyres price indices and, under normal conditions, will be upward biased compared to superlative indices. One solution will be to compile the CPI by applying long-term and short-term links. In this approach, as implemented by Sweden and United States, the long-term links are compiled by use of a superlative index formula, while the successive short-term links are calculated by use of the latest available expenditure weights. The short-term links are replaced by superlative indices when weights become available, and linked into the long-tern index. The method requires revision of the CPI and hence careful dissemination and explanation to users.

56. The following topics were identified as key future methodological challenges:

- The integration of scanner data and big data into the compilation of the CPI, and how to deal with the lack of weighting information for price data.
- How to include strongly seasonal products in the CPI.

- How to include the acquisition of durable goods in the CPI.
- How to identify financial services and include these in the CPI.
- How to deal with free goods and services, such as provided in the digitalised economy, and public goods as education, parks etc.

## H. Special Session for EECCA countries

Session chair: Lars Svennebye, EFTA

57. The session was based on presentations by Norway, Ukraine, CIS-STAT and Eurostat.

58. Norway presented a methodological and practical road map for how to deal with missing items and their replacements. A variety of methods are available. It is up to the countries to select the most suitable methods, taking quality and resource implications into account. It was advised to test methods before they are implemented and ensure that the applied method is sound and not subject to bias.

59. Ukraine presented recent achievements in the production of the national CPI and plans for further improvements. The number and allocation of price observations have been optimized, taking the cost of price collection into account. Looking forward, the statistical office considers implementing electronic data collection (handheld devices); the use of scanner data and improved compilation of price indices for owner-occupied housing.

60. Eurostat gave an overview of the development of the Harmonised Consumer Price Index (HICP) of the EU member countries. The HICP was gradually developed, based on the 1995 HICP framework resolution, by first harmonising the coverage of the national HICPs, while avoiding the more difficult areas (e.g. health, social production and owner-occupied housing). Gradually the coverage was extended and methods harmonised, and the number of HICP sub-indices that countries had to compile was increased. Due to its development and its wide use, the HICP is one of the successes of the European Statistical system.

61. CIS-STAT, Zoya Basova, presented the results of the experimental calculation of harmonised consumer price indices for CIS member countries. The CIS HICP is based on a list of detailed product groups applied for all countries. Weights and prices need to be provided for all detailed groups of products. If prices or expenditure weights cannot be observed estimated or conditional values are used. Analysis for 2016 shows relative small deviations when comparing national CPIs and CIS HICPs.

62. CIS-STAT, Irina Goryacheva, discussed price indices for different sectors of the economy and their interrelationships with the view to develop a consistent system of price indices. The presentation concluded that there are many challenges in developing a set of consistent price indices but that such a set of indices, on the other hand, would be useful for analytical purposes, for instance analysis of how inflationary pressure spreads through the different sectors of the economy or through different stages of production.

63. As part of the ECASTAT programme on capacity building in economic statistics UNECE plans to organise a regional workshop on CPI compilation for EECCA countries in 2019. Countries provided useful input for possible topics to be discussed at the workshop. Countries were encouraged to contact UNECE with further proposals for topics that could be discussed at the workshop.