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**Outcome of the in-depth review of education statistics****In-depth review of education statistics****Note by the Australian Bureau of Statistics***Summary*

The Bureau of the Conference of European Statisticians reviews each year selected statistical areas in depth. The purpose of the reviews is to improve coordination of statistical activities in the region of the United Nations Economic Commission for Europe, identify gaps or duplication of work, and address emerging issues.

The present note is an updated version of the in-depth review paper prepared by Australia and discussed at the plenary session of Conference of European Statisticians in June 2011. It incorporates the comments by the Conference expressed during the 2011 plenary session and the written contributions sent by countries after the plenary session. The paper was used as a basis for the in-depth review of education statistics by the Bureau in November 2011.

The outcome of the review is provided in document ECE/CES/2012/2/Add.1.

## **I. Introduction**

1. Given the intrinsic value of education to the global economy and community, a review of the strategic issues affecting education statistics is vital for targeted policies and reforms at the local level.
2. The Australian Government's Productivity Agenda recognises the need to support investment in skills and human capital, including measures to enhance teacher quality, improve the quality of early childhood education, and achieve ambitious targets for higher education attainment rates.
3. To help inform these and other international priorities in the education arena, this paper delivers an assessment of key conceptual and coordination issues surrounding the production of quality education data. Central to this review is the identification of information gaps, duplication of work, and possible strategies for meeting the challenges faced by collectors and users of education statistics, in Europe and beyond.
4. This revised paper, and the recommended actions it puts forward, benefits from input from discussions at the 59th plenary session of the Conference of European Statisticians (CES) and subsequent contributions from various CES countries.

## **II. International organizations and activities relating to education statistics**

### **A. International organizations**

#### **1. Eurostat**

5. The work of Eurostat reflects the goals outlined by the Council of the European Union in its Education and Training 2020 strategic framework. The framework sets the key objectives for European Union (EU) member countries to work towards achieving within the next 10 years. These include the promotion of inclusive and equitable education (including international accessibility), innovative and lifelong learning, and improved quality and effectiveness of education and training services. Other areas of emphasis are the efficiency of investments in education, language learning, flexibility of learning, student mobility, and citizenship education.
6. In line with these goals, ongoing work by Eurostat includes:
  - (a) Regular production of indicators related to reporting requirements under the Education and Training 2010 strategic objectives;
  - (b) Further development of indicators relating to monitoring and benchmarking the Education and Training 2020 objectives;
  - (c) Finalisation of the preparation of the continuing vocational training survey and adult education survey;
  - (d) Further work on consolidating the methodology and production process for data on educational attainment from various European social surveys;
  - (e) Continued contribution to the revision of the International Standard Classification of Education (ISCED) in cooperation with the Organisation for Economic Co-operation and Development (OECD) and the United Nations Educational, Scientific and Cultural Organization (UNESCO);

(f) Processing and dissemination of data on young people's transition to the labour market.

7. Other publications from Eurostat present regular overviews on education data in Europe, highlighting how European countries are responding to the challenges faced by their education systems. Recent publications are presented in the context of the global financial crisis and the significant impact it has had on economic, social and political life. The 2009 release of Key Data on Education in Europe (7th edition) argues that for long-term economic and social stability to be reinstated in this climate by a Union which spends almost 11 per cent of its budget on education, it is crucial that education expenditure be as efficient and inclusive as possible.

## **2. Organisation for Economic Co-operation and Development**

8. The current OECD work program for education and training statistics highlights a number of areas of analytical focus.

9. The Assessment of Higher Education Learning Outcomes (AHELO) feasibility study will assess whether the knowledge and skills of undergraduate students can be measured and compared internationally. Following some small-scale validation, the implementation of the survey instruments by participating countries and institutions is set to occur by December 2012.

10. Other major activities of OECD include the Indicators of Education Systems (INES) program, which provides methodological guidance on the development of internationally comparable data and indicators on education systems. In 2010, the goal for future OECD activities was to produce and publish indicators and analytical outputs on the operation, impact and outcomes of various stages of learning and training throughout life, with an emphasis on early childhood. Key ongoing activities in this space include the production of universal technical documentation on the collection of education data, and the development of various indicators, namely the value of education, the relationship between earnings and levels of educational attainment, the social outcomes of education, as well as the ways in which education systems monitor performance in schools. Recent INES activities have also included the analysis of trend data, collection of data on completion rates and average duration of tertiary studies and the continued assistance in the revisions of ISCED.

11. In line with the INES initiatives, the OECD work program has set a goal to create an international dataset and associated indicators on educational facilities, with the first phase of the Centre for Effective Learning Environments (CELE) 'International Profile on Educational Facilities Policy and Practice' pilot project on Evaluating quality in Educational Spaces (EQES) completed in 2010. Results were discussed by national project leaders in July 2010. Data collected over the 2009-10 period was set to be expanded, combined and disseminated throughout 2011.

12. The OECD Human Capital Project, which started in October 2009, aims to develop an agreed methodology for producing numerical estimates of the stock of human capital for the purposes of international and inter-temporal comparisons. The project takes the form of an international consortium consisting of 15 OECD countries (Australia, Canada, Denmark, France, Italy, Japan, Korea, Mexico, Netherlands, New Zealand, Norway, Poland, Spain, the United Kingdom and the United States), two accession countries (Israel and Russia) and one non-member country (Romania). Eurostat and the ILO are also members of the consortium.

13. Since its launch in 2009, the OECD has also continued to maintain a statistical and information sharing community entitled 'Wikiprogress' as the official platform for the OECD-hosted Global Project on 'Measuring the Progress of Societies'. The aim of the wiki platform is to stimulate global discussions about the development of progress indicators as

well as the fundamental issues concerning the measurement of the wellbeing of societies, such as the quality of education.

14. Other areas of continued work by the OECD are the Program for International Student Assessment (PISA), Program for the International Assessment of Adult Competencies (PIAAC), Indicators on Skills, Mobility and Job Quality, and the Teaching and Learning International Survey (TALIS).

### **3. United Nations Education, Scientific and Cultural Organization**

15. The UNESCO Institute for Statistics (UIS) current work program for education includes a continued effort to work in conjunction with the OECD and Eurostat to improve the quality of education data from annual surveys across all levels of formal education, as well as literacy and educational attainment.

16. One of the Institute's biggest priorities is its work in developing benchmarks and monitoring international goals in education, particularly the Millennium Development Goals and the 'Education for All' initiatives. In line with this work, the UIS is giving priority to three themes in education: literacy, teachers, and skill development for the workforce. It is also committed to a more holistic assessment of education in which inclusive life-long learning in both formal and non-formal settings is fundamental.

17. Work in these areas requires the continued development and maintenance of key education measures and classification frameworks and new indicator methodologies. These have all been listed as priorities in the UNESCO work program, as has the continued development of statistical capacity at the national level, with a particular focus on Africa and Asia.

### **4. World Bank**

18. In 2010, the World Bank priorities included the need for targeted and effective measures for enhancing early childhood education and development. With emphasis on the latter, the Bank published a report in 2010 on *The Promise of Early Childhood Development in Latin America and the Caribbean*, making the claim that investment in proper care and learning opportunities at an early age is the most cost-effective way to ensure positive outcomes in educational attainment in the future. The Bank also underlined the importance of child health and nutrition in childhood development and future achievement in a report on *Rethinking School Feeding: Social Safety Nets, Child Development and the Education Sector*, undertaken in partnership with the UN World Food Program.

19. In 2011, the World Bank Group Education Strategy 2020 outlined inclusive education as the key priority for the organisation over the next ten years. This 'Learning for All' initiative reaffirms the 'Education for All' targets for 2015 and the notion that investing in education fosters development, and that everyone should have access to education and the knowledge and skills needed to participate in society in a productive, healthy and meaningful way.

### **5. Nordic Social-Statistical Committee**

20. A recent project by the Nordic Social-Statistical Committee (NOSOSCO) emphasised the future challenges of the welfare model in Nordic countries (published in Norwegian 2009 and in English in 2010). Data was sourced from the European Union Statistics on Income and Living conditions (EU-SILC), a household sample survey carried out with the support of Eurostat. Education plays a key role in the study, with a focus on the employment, economic and living conditions of people with different levels of education.

Work-based training and further education was also a feature, highlighting the effect that further training has on employment opportunities and worker productivity.

## **B. Developments in education statistics in Australia**

21. While the Australian Bureau of Statistics (ABS) conducts regular national household-based surveys collecting education and training related data, education data from administrative sources has historically been collected, managed and reported through a jurisdictional approach, focusing predominately on activities within individual education sectors. This reflects the respective responsibilities of the Federal and State/Territory spheres of government. The ABS is proposing a way to transform data on education and training by integrating administrative and survey/census collections to construct an Australian Longitudinal Learning Database (ALLD).

### **1. Australian Longitudinal Learning Database**

22. The ABS plans to create and maintain an enduring database which would link microdata on the pathways and outcomes of Australian students from early childhood education to schooling, post-school education and ultimately labour force outcomes. The proposed ALLD would be constructed from existing administrative data, and, with community support, could include data drawn from the Census of Population and Housing as well as surveys into a central, statistical and research base. Use of existing data sources in place of new collections will provide a richer picture of the socio-demographic characteristics of populations, while reducing unnecessary duplication and limiting respondent burden.

23. Information derived from the ALLD would allow governments and researchers to develop a better understanding of the drivers and underlying factors affecting student progress and outcomes. It would facilitate improved measurement of participation in early childhood education, school performance and social inclusion, and inform national agreement reporting through the Council of Australian Governments (COAG) and other monitoring processes.

24. While data linkage has been successfully used by health researchers in Australia for some time, this is a relatively new area in education and training research. The ABS is currently in the early stages of establishing a set of feasibility studies through the 2011 Census Data Enhancement Quality Studies program, as a precursor to the development of the ALLD.

25. Aside from the ALLD project, another way in which the ABS is providing statistical leadership in areas relevant to education is in its commitment to the development of measures of human capital, as showcased by its published work and contributions to Australian and International conferences. For further discussion of this work, see the relevant section under III. Issues and Challenges (below).

### **2. Early childhood education and care statistics**

26. In 2011, the ABS published the first estimates of preschool education from a new National Early Childhood Education and Care collection. National data collection arrangements were established under an information agreement signed by relevant state and territory authorities and the Commonwealth Department of Education, Employment and Workplace Relations (DEEWR). The data collection will support monitoring progress against the Universal Access commitment (to quality early childhood education in the year before full time schooling) under the COAG National Partnership Agreement on Early Childhood Education.

### **3. Australian Early Development Index (AEDI)**

27. COAG has endorsed the AEDI, a tool for measuring childhood development which was based on the Canadian Early Development Instrument (EDI; see below). The first nationwide implementation of the AEDI was in 2009, with information collected on Australian children in their first year of full-time school. Initial results from the AEDI provide information on how children are faring in the areas of emotional maturity, social competence, physical health and wellbeing, school-based language and cognitive skills, communication skills and general knowledge. Key findings from the first AEDI study highlighted the diversity in languages spoken at home by young children and the prevalence of non-parental care and education programs. Also of particular interest was the number of children with special needs (physical, intellectual and medical), as well as the types of children who were developmentally vulnerable in the five AEDI domains. Data for the second phase of the AEDI will be collected in 2012.

### **4. Reporting school outcomes**

28. A My School website has been developed by the Australian Curriculum and Reporting Authority (ACARA), an independent authority that is responsible for publishing nationally comparable data on Australian schools. The publicly accessible My School website provides detailed information about almost 10,000 schools in Australia. It uses a new index of student and school characteristics, developed specifically for the purpose of identifying schools serving similar student populations. With continued demand for accountability and transparency in education, the website reports the average test scores of each school (derived from the student population), based on national assessments of literacy and numeracy.

29. The 2011 update of the My School website included data about student progress in literacy and numeracy testing between 2008 and 2010. Such cohort analysis allows for comparisons to be made between the performance of schools with students from similar socio-economic backgrounds over time. Discussion around these developments has raised questions about the appropriateness of using area-based indexes as a proxy for socio-economic status at the person level, highlighting the need for better measures of socio-economic status which distinguish individuals from the areas in which they live.

### **5. Vocational education research**

30. The work of the National Centre for Vocational Education Research (NCVER) has focused on participation in the Australian vocational education and training sector. NCVER's recent emphasis has been on participation in vocational education in light of changing work and lifestyle patterns, as well as the role that human capital plays in terms of productivity in the economy and skill requirements across different countries and over time. There has also been research in the areas of social inclusion, youth transitions and education pathways, life-long learning, and the quality of vocational education institutions, their courses and their teachers.

## **C. Other leading activities in education statistics**

31. While not all country-specific activities can be reviewed here, discussion of some international developments in addition to those already mentioned above illustrates both the diversity and similarities of issues being addressed by different countries.

32. Recent activities of Statistics Canada have emphasised changing trends in the attainment of immigrants, adult learning, access to education and labour force outcomes. Other continuing initiatives in Canada include the implementation and analysis of the EDI,

a population level measurement of school readiness. The provincial government of Manitoba is currently working on linking the EDI to other data sources on health, schooling and attainment information as part of its longitudinal study into the lifelong effects of early childhood development.

33. Like Canada, recent reports from Statistics New Zealand have addressed differences in outcomes of the university-educated Immigrant population. Other work has focused on student loans and allowances, income and employment outcomes of tertiary education, and pathways of school leavers without qualifications.

34. In an effort to improve the generation, access and use of high quality education data, the United States has been running a Data Quality Campaign (DQC) since 2005, with initial funding provided by the Bill and Melinda Gates Foundation. The aim of the campaign is to provide states with a framework and resources for establishing and using robust student-level longitudinal data systems, and to promote discourse and coordination of statistical activities within and between states.

### **III. Issues and challenges**

35. The information presented in this review highlights general issues and challenges for consideration by the international community for future developments in education statistics. Increased interest and collection of education data may lead to additional scrutiny placed on the legal frameworks which safeguard personal information used in statistical collections. It is vital that these legal frameworks are upheld in order to continue a robust evidence base for future use.

36. While producing and observing statistics on educational facilities and teacher quality is a focus of some international agencies, particularly the OECD, comments received by the CES community point to the following issues as the fundamental challenges facing education statistics today.

#### **A. Consistency and comparability in international statistics**

37. The continued implementation of consistent data standards, classifications and collection methodology is critical for education statistics to be internationally comparable. Continued collaboration and dialogue between organisations will encourage concerns over measurement and definitions to be openly discussed and develop a shared sense of awareness of the major issues facing education statistics in the years to come.

38. Increasing and sustaining collaboration and coordination across countries will also help avoid duplication of effort through sharing of knowledge, tools, data systems and resources.

#### **B. Measurement of human capital and the value of education**

39. Human capital can be broadly defined as the productive capacity embodied in individuals. A person's productive capacity is related to a variety of factors, such as knowledge and skills, physical and mental conditions, life experience and attitude. As 'knowledge and skills' are the most important determinants in a person's productive capacity, human capital can be also defined as the knowledge and skills embodied in individuals.

40. From a practical point of view, knowledge and skills are relatively easier to measure than the other factors, and so most empirical human capital research focuses attention on

education. There are rich data sources reporting variables that could serve as proxies of knowledge and skills, such as school enrolment and educational attainment rates.

41. Since 2001, the ABS has contributed to the advancement of measures of human capital in a variety of ways. Emphasis on the value of education has been addressed through work in the following areas:

(a) Measuring the formation of human capital by analysing how investment in education and net migration contribute to the growth of human capital stock, acknowledging the depreciating effect of an ageing population.

(b) Providing quantitative evidence of the economic benefits of completing secondary education.

(c) Establishing the rate of return of post-school education in Australia, especially for bachelor degrees.

42. The challenge to improve and develop alternative ways of measuring human capital continues to be met by various statistical agencies and collaborations around the world. To date, the OECD Human Capital Project has set up a multi-national human capital database to gather the essential information needed to measure the stock of human capital for partner countries based on the selected methodology. Second, based on this database, preliminary estimates of the value of human capital for the population of working age have been generated for the majority of the countries participating in the consortium.

43. Notwithstanding these advancements, the complexities surrounding the measurement of human capital and the value of education remain issues that require further examination.

### **C. Measurement of social inclusion**

44. Another topical theme is inclusivity in education. This is manifested in the 'Education for All' initiatives of UNESCO and the World Bank, as well as the strategic objectives of the Council of the European Union. Conceptual and methodological issues surrounding the measurement of social inclusion, as both a component and outcome of education, remain a key area of concern in many countries. The ABS proposal for the Australian Longitudinal Learning Database and the Manitoban Government's data linkage project in Canada are both tools which can be used to help measure social inclusion by assessing the lifelong impacts of education and conversely, the outcomes of non-participants in various stages of education. Statistics which better enable examination of those who face barriers, to education or to greater participation in cultural, economic and political life as a result of their educational status, are invaluable to social inclusion policy.

45. In this sense, the challenge for the international community is not only to develop consistent conceptual definitions of what social inclusion is and how it should be measured across related datasets, but also to develop appropriate instruments and methodologies to gather data on the topic. This may involve a review of survey programs and the use of administrative data, as well as a determined effort to introduce new data items for collection, such as the perceptions around barriers to learning and barriers as a result of having certain levels of educational attainment (either low or mismatched with career objectives), wherever necessary.



## **D. Longitudinal education datasets and data linkage initiatives**

46. As the overview of international activities has shown, there is increasing recognition of the need for longitudinal data on education. Of particular interest in the international community is how individual countries can link various data sources to assess alternative education pathways and the outcomes of education over time.

47. There are a number of challenges to achieving successfully linked datasets of longitudinal information. First, where linked datasets are concerned, the statistical infrastructure must be sufficient to support adequate data linkage between different sources of information. This may be administrative data, survey or census data, or data from different periods in time or place. Additionally, privacy concerns must be managed appropriately to ensure that data linkage is done in accordance with legislative requirements and is fit for purpose. Governance arrangements for access to and storage of data also need to be confirmed prior to any data linkage activities. Moreover, the quality of any data linkage will have to be assessed and accounted for in any research or outputs produced.

48. While there are a number of issues to overcome, the potential benefits for research, social policy and investment from having enduring longitudinal datasets are profound. In terms of education statistics, the challenge for countries is to assess their statistical needs and determine how data can be better used to inform the pathways and outcomes of people's education over time. The Scottish Government, as one example, has highlighted data integration and linkage as an area of importance for the future of education statistics, with recent projects focusing on the analysis of participation in higher education and the destinations of school leavers. Continued development and sharing of data methodologies between countries involved in these types of activities will help increase the pool of knowledge and experience necessary for the expansion of data integration and linkage in the treatment and reporting of educational information.

## **E. The role of administrative data in official education and training statistics**

49. In addition to the development of indicators and the classifications and standards of data, greater emphasis needs to be given at the international level to establishing the role of administrative data in education statistics, in particular, the potential benefits of using it to supplement survey data. This issue was a topic of discussion at the plenary session of the CES Bureau held in June 2010 and remains a key challenge for education data systems in the years ahead. As indicated earlier, other statistical subject matter areas, typically health, have worked on using administrative data for statistical linkage and research purposes for quite some time. In many countries, however, this type of activity has only recently started to gain momentum in the education sphere.

50. Information being available, using administrative sources in conjunction with survey data could assist with longitudinal analysis, while reducing the burden on respondents to provide information which they may have already given on a prior occasion (such as on school enrolment forms or government subsidised medical benefit records). Administrative data could provide a wealth of information with which to create longitudinal datasets from information linked to education for building knowledge and informing policy. More effective utilisation of data sources would also reduce the duplication of work done by administrative data collectors and statistical agencies.

51. While there are significant advantages in using administrative data, there are also challenges associated with access to and adaptation of the datasets. Data collected to facilitate the administration of government programs may have a number of limitations,

particularly if its original intention has a narrow focus. In each case, analysis to determine whether or not administrative data are fit for wider statistical purposes needs to be undertaken. Other issues include convincing data custodians to supply their data to statistical organisations for these purposes and for statistical organisations to use the administrative data consistently and effectively. Some countries, like the Netherlands, may already have years of experience in combining administrative and survey data on education, whereas others may need to establish mechanisms for a transition to more efficient ways of utilising alternative data sources.

## **F. Measurement of e-learning**

52. With growing interest in socially inclusive education and the demands of mobile or working students in an increasingly technological world, the proliferation of e-learning is an emerging area to which the statistical community could give greater priority. The European Council goals for increasing quality, inclusivity and international accessibility of education speak directly to this issue. However, with such grand policy initiatives come difficult issues in statistical measurement.

53. Debates continue to evolve around exactly what e-learning is and how it should be measured. Key issues include:

- (a) How to determine the place of attainment of qualifications which were obtained in one country from an overseas institution, via the internet.
- (b) How to distinguish virtual from physical education institutions.
- (c) How to compare the quality and accreditation of online studies with other qualifications.

54. These issues need to be clarified through international forums so that official statistics on attainment can accurately reflect current levels of education in the community and so that data is consistent and comparable among countries. The issue of double counting particular qualifications due to uncertainty over place of attainment also needs to be addressed.

## **G. Responding to changes in early childhood education**

55. Greater emphasis on education pathways and trajectories has given new impetus not only to ensure that a greater number of people receive pre-school education, but also to document processes surrounding these activities accurately and consistently. Further dialogue around new international classifications of early childhood education is essential to ensure that the rich information that can be obtained from early childhood is collected and effectively used and compared, both within and between countries.

56. The changes to the ISCED level 0 in the 2011 revisions reflect the global proliferation of early childhood education programs. The new ISCED level 0 now extends beyond pre-primary education (coded as 0.2) to include early childhood development programs for children under 3 years of age (coded as 0.1).

57. Methods of distinguishing these from other types of programs, which may be either ISCED level 1 or care-based, may prove problematic as countries adjust to the new classification scheme. Differences in the nature of education systems (compulsory versus non-compulsory) and the age of attendees at particular institutions also make effective and realistic comparisons difficult to establish.

## IV. Directions for future development

58. Reflecting comments from the CES community on the key issues and challenges facing education and training statistics today, the following points require further action by the international statistical community:

(a) The international community must continue to collaborate and discuss major issues affecting the collection and reporting of education statistics. This will help identify gaps and inconsistencies between national collections, give rise to new methods and strategies for conceptual development and reduce duplication of effort. Areas requiring further development and collaboration include the revision of the measurement and classification of human capital, social inclusion and early childhood education. The requirement for consistent definitions and measures of e-learning is also of growing importance in the international arena.

(b) Linking education data to other datasets (administrative and non-education based) to build a longitudinal picture of education pathways and transitions needs to be advanced through continued sharing of best practice of data linking methodologies, shared sources of data linkage, and the quality of linking and the research produced from linked datasets.

(c) Statistical bodies involved in the generation and use of education statistics should be making greater use of administrative data (if not already doing so), as well as gauging public attitudes towards its use for statistical purposes. Sharing of methods and systems already in place in some countries, in education and training and other statistical spheres, will prove valuable for the further utilisation of administrative data by statistical agencies.

## V. Recommended actions

59. The following recommendations for progressing statistics on education and training reflect the discussion at the CES plenary session in June 2011 and subsequent feedback from selected member countries:

(a) Establish an education-specific 'wiki' that fosters further discussion in the international community about data collection methods, experiences, conceptual consistency and knowledge specifically about education and training. Other existing wikis may be used. However; in this case, activity in the education and training areas of these larger wiki spaces needs to be much more vigorously promoted and focus beyond progress and development alone. While OECD's Educationtoday blog is designed to be a space for collaboration and discussion of emerging issues in the education sphere, feedback from the CES community is that a new platform is needed to emphasise and guide the statistical component of education and training issues internationally. To be an effective platform for engaging the education statistical community, the proposed wiki space would require a strong user base. It would also need to have a dedicated host, as well as some way of monitoring user activity. This may be through a group or collective dedicated to observing and consolidating content, summarising the ongoing dialogue between contributors and disseminating this information to a wider audience base.

(b) Second, as a result of wiki discussions, create a framework or best practice guide for the appropriate use of administrative datasets in conjunction with other official statistics drawn from survey and census data. This could also provide best practice advice on data linkage and the creation of longitudinal datasets. Ideally, the best practice guide would be reviewed and endorsed by a small group of CES members and observers, which reflects a diversity of experience in the use of administrative data and linkage systems.

Ultimately, the guide would provide a centralised and up-to-date resource for informing the statistical operations of all countries pursuing data integration initiatives in education and training. It would provide ways to improve or expand on their use of secondary and mixed data sources.

(c) A third recommendation is for a small working group to be formed to investigate international practice in measuring e-learning, specifically looking at how e-learning is incorporated into national education systems for reporting purposes. This work could assist future developments in conceptualising and measuring e-learning as part of the broader education and training statistical environment.

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