

International applicability of a measurement of child development: implications for a global indicator. Janus M.¹, Brinkman S.²

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INTRODUCTION: A country's record on child development is a profound predictor for its future prosperity (or, conversely, future economic burden). However, convincing governments of the importance of investment in early child development is difficult without reliable comparative data. The differences in child development across and within countries can only be investigated by application of an internationally comparable population-level measurement. The Early Development Instrument (EDI) is a measure of early childhood development easily applicable for population-level assessment. The EDI includes 5 developmental domains: physical health and well-being, social competence, emotional maturity, language and cognitive development and communication skills and general knowledge. So far the EDI has been validated and used on a population basis in Canada, Australia and the United States and has now been piloted in 10 other countries, and translated into 9 languages (English, French (Canadian), Spanish, Albanian, Moldovan, Dutch, Arabic, Tagalog and Bahasa Indonesian).

CASE STUDIES: Five cross-cultural validation case studies are presented providing different examples of how the EDI was adapted and utilised in diverse circumstances while maintaining methodological rigour.

	CANADA	AUSTRALIA	MEXICO	INDONESIA	MOLDOVA
Context	PopIn: 31 million. Canada has recently been the strongest economic performer of the G8 with a high per-capita income and the highest per-capita immigration rate in the world. There are various federal but primarily provincially funded early childhood health and education initiatives which are non-standardised. The EDI was developed to provide a feasible and affordable psychometrically sound tool to report on populations of children, monitor groups of children over time, and to predict early school performance.	PopIn: 21 million. A wealthy western country however with increasing inequality and the poorest health outcomes of any indigenous population in the world. School is compulsory at age 6 years, however early childhood health and education initiatives are disparate, relatively unregulated and non-standardised with a mix of federal, state and local government funding. Similarly to Canada the EDI is used as a population measure for communities to determine how well they are raising their children to school age.	A federally-funded early childhood program "Centros de Desarrollo Infantil" (CENDI) exists for poor children aged 45 days to 6 years. The program is based on the early childhood education model in Cuba (providing all-encompassing, affordable care with major parent involvement), and is of interest for many advocates of the importance of early child development around the world. With the financial assistance of the World Bank, the EDI data were collected for all 4-5 year old children attending the CENDI.	PopIn of 222 million people with 16% living below the poverty line. 27% of children aged <5 years are malnourished and 77% aged 2-6 are not enrolled in any ECD service. The Govt. of Indonesia via a \$127million World Bank loan has launched a community based approach to increase access to ECD services. The program targets an estimated 738,000 children aged 0-6 living in 6,000 poor communities. The EDI is one of the instruments being used in a clustered randomised controlled trial to evaluate the programs impact.	Moldova is the poorest country in Europe with a population of 4.2 million, with more than 50% living in rural areas. In 2006, the Republic of Moldova received a Fast Track Initiative grant to support activities in the area of education. In this context, the Ministry of Education expressed interest in learning about measurement and evaluation experiences in other countries, and in collaboration with the World Bank decided to pilot the EDI.
Time-line	1998- ongoing	2002 - ongoing	April 2007 - ongoing	July 2007- Dec 2013	March to June 2007.
Process	The EDI was developed by Drs. Offord & Janus of the Offord Centre in conjunction with the Canadian Institute for Advanced Research. In 1999/2000 N=45,000 via the UEY study and various communities in Ontario. By 2002 N=150,000 with the EDI implemented in 6 provinces and has continued to expand ever since.	In partnership with Offord an initial pilot on 200 children in 2002 and then adopted by the North Perth Metropolitan Health Service N=4,500 in 2003. Federal govt and Shell Aust. funded the Centre for Community Child Health and the Telethon Institute for Child Health Research (TICHR) 2003-2007 N=40,000.	In consultation with Offord the Spanish EDI long version (used previously in Chile and originally backtranslated) was adapted for Mexico with minor changes. Data were collected and entered in Monterrey then sent to Offord for analyses.	A series of content validity workshops were conducted both pre and post translation with the short EDI. Two small pilots in the field have been completed to determine ceiling/floor effects and the parent's ability to answer the questions by trialling a mix of parental report and observation.	Focus groups with International Step by Step Association elementary teachers were conducted to determine the content validity of the short EDI. In consultation with Offord the Moldovan version was then backtranslated and pilot-tested with a sample of 28 teachers. Data were analysed at the Offord Centre.
Validation	Content validity, repeat-test reliability, inter-rater reliability, construct, concurrent and predictive validity and psycho-metric analyses.	Content validity, repeat-test reliability, construct, concurrent and predictive validity and psychometric analyses.	Parent-completed questionnaire, psychometric analyses	Content validity. Parent-completed questionnaire. Planned inter-rater reliability as well as construct and predictive validity testing.	Planned for the next stage of the study
Outcomes	The EDI is now used in 7 provinces with greatest use in Ontario, British Columbia and Manitoba. Communities are now tracking their EDI scores with great interest in what precipitates/impacts their change in results over time.	Indigenous specific and cultural and linguistically diverse sub-population group studies being undertaken. National census of all 5 year olds in Australia in 2009 (n=250,000). Adoption of the AEDI as a National Progress Measure.	Currently, the EDI has been adopted as a monitoring tool for the population of about 200,000 kindergarten aged children in the state of Nuevo Leon, and the data are currently being collected. The project is funded by the state Ministry of Education.	The first backtranslation (post field pilots) is now being reviewed by TICHR and Offord. Amendments to be made prior to full pilot in August and baseline rollout by the end of the year.	Although the aim was to design and conduct a validation study, with the goal of community level population implementation by 2008 the project stopped at the preliminary stage due to uncertain funding.
Results to date.	N >520,000. Phy=8.79, Soc=8.29, Emot=8.05, Lang=8.36, Comm=7.73	N >37,000. Phy=8.94, Soc=8.41, Emot=8.18, Lang=8.34, Comm=8.06	N=918. Phy=9.39, Soc=9.28, Emot=8.15, Lang=7.59, Comm=9.17	N=12	N=28. Phy=7.28, Soc=5.64, Emot=5.60, Lang=7.49, Comm=5.77

CONCLUSION: These studies have yielded promising results for the EDI's usefulness as a global indicator, however highlight the need for a process whereby the EDI can be efficiently applied and refined in each new context, ensuring the greatest cultural and linguistic validity while maintaining international comparability and reliability. An International Consortium for the EDI has now been established to aid countries interested in adapting the EDI. The aim of the Consortium is to build local capacity, provide technical skills, ensure integrity and advocate for the use of the EDI as a population health measure.

