CRVS Fellowship profile:

Completeness of death registration in India: national and sub-national estimates, Jayanta Kumar Basu

Resources available from the University of Melbourne, Bloomberg Philanthropies Data for Health Initiative

CRVS course prospectuses
These resources outline the context, training approach, course content and course objectives for the suite of CRVS trainings delivered through the Bloomberg Philanthropies Data for Health Initiative. Each course focuses on a specific CRVS intervention or concept, and is designed to support countries to strengthen their CRVS systems and data.

CRVS Fellowship reports and profiles
The CRVS Fellowship Program aims to build technical capacity in both individuals and institutions to enhance the quality, sustainability and health policy utility of CRVS systems in Fellows' home countries. *Fellowship reports* are written by Fellows as a component of the program, and document, in detail, the research outcomes of their Fellowship. *Fellowship profiles* provide a summary of Fellows' country context in relation to CRVS, an overview of the Fellowship experiences, the research topic and the projected impact of findings.

CRVS analyses and evaluations
These analytical and evaluative resources, generated through the Initiative, form a concise and accessible knowledge-base of outcomes and lessons learnt from CRVS initiatives and interventions. They report on works in progress, particularly for large or complex technical initiatives, and on specific components of projects that may be of more immediate relevance to stakeholders. These resources have a strong empirical focus, and are intended to provide evidence to assist planning and monitoring of in-country CRVS technical initiatives and other projects

CRVS best-practice and advocacy
Generated through the Initiative, CRVS best-practice and advocacy resources are based on a combination of technical knowledge, country experiences and scientific literature. These resources are intended to stimulate debate and ideas for in-country CRVS policy, planning, and capacity building, and promote the adoption of best-practice to strengthen CRVS systems worldwide.

CRVS country reports
CRVS country reports describe the capacity-building experiences and successes of strengthening CRVS systems in partner countries. These resources describe the state of CRVS systems-improvement and lessons learnt, and provide a baseline for comparison over time and between countries.

CRVS technical guides
Specific, technical and instructive resources in the form of *quick reference guides, user guides* and *action guides*. These guides provide a succinct overview and/or instructions for the implementation or operation of a specific CRVS-related intervention or tool.

CRVS tools
Interactive and practical resources designed to influence and align CRVS processes with established international or best-practice standards. These resources, which are used extensively in the Initiative's training courses, aim to change practice and ensure countries benefit from such changes by developing critical CRVS capacity among technical officers and ministries.

Suggested citation

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From February to March 2020, Jayanta Kumar Basu from the United Nations Children's Fund (UNICEF) in India undertook a Civil Registration and Vital Statistics (CRVS) Fellowship through the Bloomberg Philanthropies Data for Health (D4H) Initiative at the University of Melbourne (UoM), estimating the completeness of death registration in India at the national and sub-national levels.

This profile documents Jayanta's personal experiences and outcomes and the broader impact his Fellowship might have on improving the quality of mortality data in India.

For more information on the CRVS Fellowship Program, including information on how to apply for a Fellowship, visit the CRVS Knowledge Gateway at: https://crvsgateway.info/fellowship
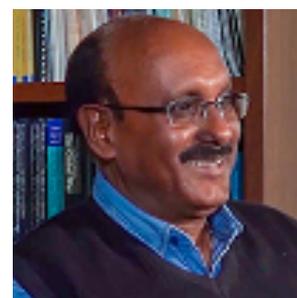
Pre-Fellowship: Jayanta's workplace

Supported by UNICEF, Jayanta works as a State Coordinator for CRVS in Bihar, India.

After graduating from the International Institute for Population Sciences (IIPS, Mumbai, India) with two Master's degrees – one in statistics, and the other in population studies – Jayanta went on to complete a PhD in population studies. After completing his PhD and spending several years working for corporate organisations, Jayanta wanted to contribute his expertise to the development sector, switching to a career in the field of population and health.

Supported by the UNICEF Field Office in Bihar, India, Jayanta is now a State Coordinator for CRVS in the state of Bihar. His role involves providing technical input and support to the Bihar Government's Directorate of Economics and Statistics as part of efforts to improve the state's CRVS system (**Box 1**). By ensuring that the country's CRVS system captures vital events like births and deaths at the sub-national (state) level, India will be able to generate reliable vital statistics which are crucial for the formation of effective health policy and planning.[2]

2   Richards N, Sorchik R, Brolan C. *Why the Sustainable Development Goal agenda needs strong civil registration and vital statistics systems.* CRVS best-practice and advocacy. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2018.

CRVS Fellowship reports and profiles

CRVS Fellowship profile: Completeness of death registration in India: national and sub-national estimates, Jayanta Kumar Basu | 0820-01   3

Box 1: CRVS in India

Although birth and death registration are mandatory in India, death registration in particular remains a challenge, resulting in inaccurate mortality statistics.[2] An estimated seven million deaths occur annually throughout the country, but less than 20 per cent of registered deaths include information on the age and sex of the decedent.[3]

Because of these CRVS system weaknesses, India depends on vital statistics produced by its Sample Registration System (SRS).[4] SRS data, however, are produced periodically (every two years on average[5]) and are not available in real-time. Subsequently, Indian decision-makers lack timely, accurate mortality data to guide the formation of targeted health policies.

Applying for the Fellowship

Jayanta was eager to learn how to estimate the completeness of death registration at sub-national and national levels.

Bihar currently struggles with low birth and death registration completeness (**Box 2**), resulting in a lack of accurate birth and death statistics for the state.[3] As such, Jayanta wanted to learn how to analyse existing birth and death data to effectively estimate the completeness of registration and produce mortality estimates for India. After consultation with a colleague, Jayanta applied and was accepted for the CRVS Fellowship program.

Box 2: What is registration completeness and why is it important?

Unregistered deaths may have a different cause of death (COD) profile than registered deaths, so registration completeness is important for governments to make planning and policy decisions with confidence, based on the knowledge that vital registration data are unbiased and complete.[6,7] The completeness of registration is defined as the percentage of actual births or deaths in a population that are registered. Put another way, it is the number of registered births or deaths divided by the actual number of births or deaths in a population.[8]

$$\text{Completeness of death registration (\%)} = \frac{\text{number of registered deaths}}{\text{actual number of deaths}} \times 100$$

By undertaking the Fellowship, Jayanta hoped to learn techniques for producing accurate mortality estimates for India at both sub-national (i.e. state-level) and national levels – and as such, Jayanta's Fellowship topic focused on estimating the completeness of death registration at the national level and at 30 sub-national levels.

2   Office of the Registrar General and Census Commissioner, India. *Civil Registration System Division.* Ministry of Home Affairs, Government of India. Available from: https://www.censusindia.gov.in/vital_statistics/crs/crs_division.html

3   Office of the Registrar General, India. *Civil Registration System (CRS) Report 2018: Statement 20/21*: pp. 66-68.

4   Unite Nations. *An Overview of the Sample Registration System in India.* UN Stats. Available from: https://unstats.un.org/unsd/vitalstatkb/KnowledgebaseArticle50447.aspx

5   Mahapatra, P. 2010. *An Overview of the Sample Registration System in India.* Prince Mahidol Award Conf. and Global Health Information Forum. Available from: https://www.researchgate.net/publication/228471937_An_Overview_of_the_Sample_Registration_System_in_India

6   The University of Melbourne. *The importance of routinely measuring birth and death registration completeness.* CRVS best-practice and advocacy. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, The University of Melbourne; 2018.

7   Andrade, J. *Estimating the completeness of birth and death registration in Ecuador.* CRVS Fellowship reports and profiles. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, the University of Melbourne, and National Institute of Statistics and Census, Ecuador; 2018.

8   University of Melbourne. *Challenges associated with automated VA training and rollout.* CRVS best-practice and advocacy. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, The University of Melbourne; 2018.

CRVS Fellowship reports and profiles

4   CRVS Fellowship profile: Completeness of death registration in India: national and sub-national estimates, Jayanta Kumar Basu | 0820-01

Undertaking the Fellowship

Upon arriving in Melbourne, Jayanta began learning how to use India's available data to make mortality estimates and assess the completeness of death registration. Jayanta's dataset included both national data and data from 30 sub-national levels in India from 2000 to 2018, with 2018 being the last year in which India had published its CRVS data.[3] To help Jayanta assess registration completeness, Jayanta's Fellowship supervisor, Dr Tim Adair, instructed him in an empirical method for estimating the completeness of death registration.[9]

After calculating death registration completeness estimates, Jayanta then compared his estimates with other existing sources, including the Indian government's death registration completeness estimates, finding similarities as well as mismatches between these numbers.

Jayanta noted that in Indian states with greater completeness of registration, his estimates closely matched the government estimates, whereas states with lower registration completeness had more discrepancies. Moreover, Jayanta's crude death rate (CDR) estimates largely matched those made by the Indian government using existing CRVS data, whereas estimates made using SRS data tended to conflict with those made using CRVS data.

Throughout his time in Melbourne, Jayanta learned not only from technical experts at UoM, but also from other Fellows undertaking Fellowships at the same time. Hearing about Tanzania's SRS, as well as learning about Colombia's implementation of civil registration at the sub-national level, provided Jayanta with important information to help gauge CRVS-improvement strategies most appropriate for the Indian context.

Moving forward

After returning to India at the conclusion of his Fellowship, Jayanta will present his work to CRVS stakeholders, including government ministries, and local and international non-government organisations. He then plans to continue calculating death registration completeness estimates on a micro-level over the coming years. As districts continue to collect death data, Jayanta will be able to analyse registration completeness and calculate estimates for mortality indicators at the district-level, one state at a time.

As India continues to strengthen its CRVS system, tracking estimates of registration completeness and mortality will help to pinpoint areas in need of improvement, allowing for the formation of effective health policy and programming decisions at the state, district, and national levels. As Jayanta highlighted, having access to timely and accurate mortality statistics will allow India to maximise the health and wellbeing of its population.

9   Adair, T., and Lopez, AD. Estimating the completeness of death registration: An empirical method. *PLoS ONE* 2018; 13(5):e0197047.

The program partners on this initiative include: The University of Melbourne, Australia; CDC Foundation, USA; Vital Strategies, USA; Johns Hopkins Bloomberg School of Public Health, USA; World Health Organization, Switzerland.

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