Using linked data and a life-course approach to understand the developmental pathways to intentional self-harm in children

Nan Hu[1], Rebecca Glauert[1], Jianghong Li[1,2]
[1] Telethon Kids Institute, The University of Western Australia, Perth, Australia
[2] Social Science Research Center, Berlin, Germany

The last three decades have seen mounting evidence that intentional self-harm in people aged below 18 is influenced by a wide range of biological, social, and psychological factors at individual, family, and community levels. These findings highlight the importance of incorporating a life-course approach in examining the developmental trajectories leading up to intentional self-harm. The Life-course approach aims to identify the underlying biological, behavioural and psychosocial processes that operate across the life span, and attaches great importance to the critical periods such as sensitive developmental stages in childhood and adolescence when social and cognitive skills, habits, coping strategies, attitudes and values are more easily acquired than at later ages [1]. Therefore, using a life-course framework not only improves people's understandings of the underlying determinants, course, precipitating factors, and potential consequences associated with intentional self-harm, but also benefits the development of more appropriate and targeted prevention and early intervention strategies aimed at reducing the incidence of intentional self-harm and suicide among children, and improving their mental health and social engagement, which in turn has a long-term positive impact on their overall wellbeing across the life-span.

Reducing intentional self-harm and suicide is everyone's business and a life-course approach suits well into this notion as it requires interdisciplinary perspectives. As the development of intentional self-harm involves a complex interplay among biological, social, and psychological determinants, health and social services should join together to combat intentional self-harm in children. For health services, it should cover an integrated service delivery including mental health, physical health, and obstetrics. This is because people with intentional self-harm are also more vulnerable to many other physical illnesses as comorbidities [2]. Additionally, research has shown that there is a link between restricted fetal growth [3], maternal behavioural and mental health problems during pregnancy and the perinatal period [4] and the increased suicide risk in later life. On the other hand, more social services (including social network building) should be directed to families with socioeconomic disadvantages to gain more access to equal opportunities of education and work. These families include those with teenage parents, single mothers, unemployed parents, parents with low educational attainment, and parents with mental illnesses or substance use problems. Social supports should also target children who have mental illnesses or intellectual disabilities, children who are scarred by abuse and neglect in their childhood and placed in out-of-home care, and children who have contact with corrective services. All of these supports have the ability to provide preventive services, if they are delivered based on the early identification of those potentially at high risk and with great appreciation of the critical developmental stages in prenatal period and childhood and adolescence (puberty).

Using linked data to identify risk factors and outcomes

The Developmental Pathways Program (DPP), which is funded by the Australian Research Council (ARC) Linkage Grants, takes a multidisciplinary and holistic approach to investigate the pathways to a wide range of outcomes among Western Australian (WA) children and youth including health and wellbeing, education, disability, child abuse and neglect, mental health, intentional self-harm and suicide, and juvenile delinquency. To achieve this, the Telethon Kids Institute in Western Australia is collaborating with a number of state government departments, including the WA Departments of Health, Education, Child Protection and Family Support, Corrective Services, Communities, Aboriginal Affairs, Treasury, Housing, Attorney General, the Disability Services Commission, School Curriculum and Standards Authority, the Mental Health Commission, and WA Police. The project has established the process of linking together de-identified longitudinal,

population-based data collected and stored by these WA government departments with an aim to create a cost-effective research and policy planning/evaluation resource. The data linkage is undertaken by the Data Linkage Branch in the WA Department of Health, which is in charge of the routine management and maintenance of the data linkage system. The linked data are being used to identify multi-level and early determinants at the child, family and community level of developmental outcomes and the interrelationships among them. The knowledge derived from these studies are used to inform government policies, practice and planning initiatives that are preventative, culturally appropriate and cost efficient, and to improve the collection, utilisation and reliability of each of the contributing data sources in program evaluation and policy development, while enhancing whole-of-government initiatives across multiple government sectors.[1]

Generally, the linked data information has the following advantages over the data collected from survey studies: First, study samples are drawn from whole populations to avoid selection bias. Second, outcomes and risk factors are measured objectively and recorded on a routine basis which makes early risk factors (e.g., birthweight, gestation) and clinical diagnosis accessible. Third, data linkage assembles life-course events accurately in chronological order. Fourth, data linkage enables genealogical linkage for investigating intergenerational transmission of risk factors for adverse developmental outcomes. Lastly, data linkage is cost-effective.

Our investigation into the *developmental pathways of intentional self-harm in children and adolescents* (people aged below 18) sits under the Developmental Pathways Program, and is currently sourced from six WA jurisdictions including Departments of Health, Child Protection and Family Support, Education, School Curriculum and Standards Authority, Drug and Alcohol Office, and Disability Services Commission. We believe that linked data can provide extremely important information on risk factors for deliberate self-harm and suicide, as well as educational outcomes for children who engage in deliberate self-harm. This will allow early intervention programs to be properly targeted at those who are most at risk and vulnerable for deliberate self-harm and suicide. The datasets used in our study are shown in the following table:

Name of dataset[2]	Year of beginning
Midwives Notification System	1981
Birth Register	1981
Mortality Register	1969
Hospital Morbidity Data System	1970
Mental Health Information System	1966
Emergency Department Data Collection	2002
Western Australia Literacy & Numeracy Assessment (WALNA)	1999-2007
National Assessment Program – Literacy and Numeracy (NAPLAN)	2008
Attendance & Suspension Data	2004
WA Curriculum Council Data	2007
Children Protection Data	1990
Drug and Alcohol Office Data	1985
Western Australia Register of Developmental Anomalies (WARDA)	1981
Intellectual Disability Exploring Answers (IDEA)	1983

Aims of our investigation

[1] For more information about DPP and data linkage in WA, please visit the following websites:
http://telethonkids.org.au/our-research/projects-index/d/developmental-pathways-in-wa-children-project/
http://www.datalinkage-wa.org/projects/developmental-pathways-project
http://www.datalinkage-wa.org/data-linkage

[2] for more information of the datasets please visit the website:
http://www.datalinkage-wa.org/data-linkage/data-collections

Our investigation has two main aims. The first aim focuses on the developmental pathways to the intentional self-harm related hospitalization of children from different perspectives. The second aim is to investigate the current trend of intentional self-harm related hospitalization of children in WA. As the distribution and pattern of risk factors for Aboriginal and non-Aboriginal people vary significantly, our investigation will be undertaken separately for the Aboriginal and non-Aboriginal children.

References:

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4. Pearson, R.M., et al., *Maternal depression during pregnancy and the postnatal period: risks and possible mechanisms for offspring depression at age 18 years.* JAMA Psychiatry, 2013. **70**(12): p. 1312-9.