

## Part B. LifeSpan: the design and delivery of a multilevel, integrated suicide prevention model

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### 1. Summary of research (400 words)

**Problem.** Suicide presents a significant health burden in terms of premature mortality and preventable disability, with more than 3,000 deaths per year in Australia, and between 10 – 30 attempts per death. Despite suicide prevention being a global health priority, there has been no appreciable decline in suicide deaths, attempts or ideation in more than a decade. Given the scope, severity, and consistency of the suicide problem, it is becoming increasingly important that if impact is to be made at the population level, efforts need to focus on delivering multiple evidence-based approaches to address the complexity of the problem, and improve the quality of data to understand what, and where, prevention efforts are required, so as to more optimally deliver and support prevention.

**Solution.** The LifeSpan trial is a six-year project (2016 – 2021), funded by a \$14.7M philanthropic grant, to design, deliver, and evaluate the first multilevel approach to suicide prevention in Australia. LifeSpan involves implementing nine evidence-based strategies simultaneously into four regions in NSW. To support the trial sites in planning, resourcing, and evaluating the impact of LifeSpan, a data team (lead by Tye, in partnership with Australian National University) has developed the most comprehensive suicide death and attempt data set in NSW. This data has been used to develop regional risk profiles ('suicide audits') for each site to prioritise means restriction efforts at the local level, in accordance with priority populations. Suicide audits are provided annually to monitor change in site's needs over time and the overall effectiveness of LifeSpan.

**Outcomes.** In phase I of LifeSpan, Tye and colleagues conducted the first geospatial analysis of suicides in NSW to identify regions with high suicide clustering (Torok et al., 2017, BMC Psychiatry); work which informed where LifeSpan would be implemented. In Phase II, suicide audits lead to the identification of three local suicide 'hotspots' and local action has been undertaken to put physical barriers at these sites; from this work, Tye and other LifeSpan researchers have submitted a paper to *SPPE* (under review) to highlight the importance of small area analysis to suicide prevention tailoring. LifeSpan's data work has led to the establishment of a group at Black Dog, co-lead by Tye, to develop a national suicide data system that be able to provide analytics on suicide data to health and community organisations involved in suicide prevention.

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### 2. Describe how your research illustrates the category of Innovation (200 words)

LifeSpan is innovative because it:

- *Is an Australian and world first.* LifeSpan presents a new approach to preventing suicide, which uses 'what works' in targeted way that can be adapted to regional needs. The model, even now, if shown to be effective will position Australia as a leader in the field of integrated suicide prevention.

- *Helps us understand suicide trends in new ways.* Considerable effort has been spent on acquiring and manually geocoding suicide death and attempt data for LifeSpan. The precision of this data allows us, for the first time, to accurately monitor suicide trends at small area geographies, and through spatial epidemiology, identify new and emerging suicide hotspots. At the end of the trial, we will have established the most comprehensive, linked suicide data set which will be used to develop new insights into suicide trajectories, and to health service utilisation for suicide events.
  - *Has influenced national suicide prevention efforts.* The LifeSpan model has influenced suicide prevention nationally, with Black Dog Institute having received \$4.5M in commonwealth funding to support the implementation of LifeSpan, with implementation advice founded on suicide audits. Of the 12 national suicide prevention trial sites, LifeSpan has been adopted by 11 Primary Health Networks.
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### 3. Summarise the potential contribution to and/or implications for society (200 words)

- **20% reduction in suicide deaths and 30% reduction in suicide attempts.** When combined, the nine strategies of LifeSpan are expected to have a significant population-level impact on reducing suicide rates, consistent with similar international interventions.
  - **Improved ability to understand, evaluate, and improve suicide prevention efforts in Australia.** The datasets and data capabilities that we have acquired through LifeSpan and our data partnerships with SAS, the global software company, and the Australian National University mean that we have established some of the best data, analytic capabilities, and systems to make sense of the data and feed it back to the organisations and people who need it to make decisions.
  - **Improved resource allocation.** The suicide audit process within LifeSpan help trial sites make evidence-based decisions about how to allocate limited resources to target the biggest problems and priority populations in their region.
  - **Reduced stigma around suicide and improve help-seeking attitudes.** Our data platform and analytic capabilities are being used to monitor the reach of the LifeSpan and identify ongoing opportunities to engage with the communities to optimise uptake. This approach enables the whole community to be part of suicide prevention by improving early identification and reducing the stigma surrounding suicide.
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### 4. Describe any contribution by Mental Health consumers/persons with lived experience other than as subjects (200 words)

The Lifespan Project has fostered lived experience contribution through:

- Inclusion of two lived experience (LE) representatives as members of the LifeSpan Research Steering from the project's inception in 2016. As part of this committee, these LE representatives have had the opportunity to contribute to design and evaluation framework, and to participate in developing solutions to address key challenges experienced at the local implementation level. Additionally, the LE

advisory panel who were part of the Centre for Research Excellence in Suicide Prevention were consulted on issues relating to specific strategies within LifeSpan, and to approve language in major protocol documents.

- An evidence-based framework was developed specifically for LifeSpan to provide guidance on how the LE perspective could be incorporated into the trial. The framework was developed by consumer-focused researchers, in conjunction with consumers, at the Australian National University (Suomi et al., (2017). *Framework for the engagement of people with a lived experience in program implementation and research: Review and report prepared for LifeSpan*) and has guided the involvement of all LE consumers at every level in the project. The involvement of consumers and the development of a framework is itself novel and is a major contribution to academic consumer research.

## Curriculum Vitae: DR MICHELLE TYE

Black Dog Institute, University of New South Wales, Sydney, Australia | (02) 93829289 | [m.torok@unsw.edu.au](mailto:m.torok@unsw.edu.au)

### Qualifications

- 2015 Doctorate of Philosophy (PhD), Public Health, University of NSW (Summa Cum Laude; conferred 10<sup>th</sup> Sept 2015)
- 2009 Masters of Social Science, Charles Sturt University
- 2004 Bachelor of Social Sciences (Honours), University of NSW

### Employment & Academic Appointments

- 2017- Current Research Fellow (Lecturer, Level B), Black Dog Institute, University of NSW, Australia
- 2015 - 2017 Research Associate, Black Dog Institute, University of NSW
- 2007 - 2015 Senior Research Officer, National Drug & Alcohol Research Centre, University of NSW
- 2005 - 2007 Research Officer, National Drug and Alcohol Research Centre, University of NSW

### Awards, Prizes, and Scholarships (Total: \$103 500)

- 2018 NSW Young Tall Poppy, Australian Institute of Policy and Science
- 2018 Academic Women in Leadership Program (AWIL), UNSW.
- 2018 UNSW Innovation of the Year Award - Black Dog Institute's Digital Dog Team, UNSW.
- 2017 Society for Mental Health Early Career Scholar Award, \$20,000
- 2016 Black Dog Institute Travel Award, \$3500
- 2016 Best poster presentation (first runner up) at the Brain Sciences Symposium, Sydney \$1,500
- 2015 CRESP Research Group. Research Focus Award 2015 awarded to the NHMRC Centre of Research Excellence in Suicide Prevention, The Mental Health Services.
- 2015 CRESP Research Group. LiFE Award for Excellence in Research for the NHMRC Centre for Research Excellence in Suicide Prevention, Suicide Prevention Australia.
- 2013 Dean's List Award for Academic Excellence, University of New South Wales
- 2013 Postgraduate Student Research Scheme Travel Fund, University of New South Wales, \$2500
- 2011 PhD Scholarship Award, National Drug and Alcohol Research Centre, \$76 000

### Grants (Total: \$20.5M; \$15.55M as CI)

- 2018 CIA - *Cyberbullying and suicide prevention*. Black Dog Foundation. Value: \$75,000
- 2018 CIA - *The Good Behaviour Game*. IMPACT Perpetual Fund. Value: \$27,456
- 2018 CIA – Big Data in Suicide Prevention. Anika Foundation. Value: \$105,000.
- 2018 CIB - *Development of an app for managing suicide risk in youth*. SVA Diversified Impact Fund. Value: \$165,400.
- 2018 AIB - *Using social media data to identify markers of depression risk among individuals: A longitudinal cohort study* (APP1165233). NHMRC Project Grant. Value: \$324,452.40
- 2018 AIE - *Centre for Research Excellence in Suicide Prevention: CRESP II* (APP1152952). NHMRC Centre for Research Excellence. Value: \$2.46M
- 2017 CIA - *National Health and Medical Research Council Early Career Fellowship* (APP1138710). Value: \$322,952.00.
- 2017 CIA – Black Dog Institute Kickstart Funding. Value: \$20,000.

- 2017 AIE - A RCT of depression prevention in adolescents: *The Future Proofing trial* (APP1138405), NHMRC Project Grant (Category 1), Value: \$2.18M
- 2016 CIC – *LifeSpan: A systems approach to suicide prevention*. Paul Ramsay Foundation. Value: \$14.76m.
- 2016 CIB – *A supporting resource for primary health networks on evidence-based suicide prevention strategies*. Department of Health (Health/060/1516). Value: \$98,000.00.

**Peer Reviewed Publications (Total: 40, H index = 17, Total citations = 827)**

1. Hill, N., Reavley, N., Shand, F., **Torok, M.**, & Halliday, L. (In Press). Development of best practice guidelines for suicide-related crisis response and aftercare in the emergency department or other acute settings: A Delphi expert consensus study. *BMC Psychiatry*.
2. Wong, Q., Werner-Seidler, A., **Torok, M.**, Calear, A. (In Press). Christensen, H. Service Use History of Individuals Using an Online Suicidal Ideation Program. *JMIR Mental Health*.
3. Calear, A. L., Werner-Seidler, A., **Torok, M.**, & Christensen, H. (2018; In press). School-based prevention and early intervention programs for depression. In A. W. Leschied, D. H. Saklofske, & G. L. Flett (Eds.), *The Handbook for School Based Mental Health Promotion: An Evidence Informed Framework for Implementation*. Springer Publishing.
4. Darke, S., **Torok, M.** & Ross, J. (2017). Developmental trajectories to heroin dependence: theoretical and clinical issues. *Journal of Applied Social Psychology*. 47(3), 165 – 171.
5. **Torok, M.**, Konings, P., Batterham, P. Christensen, H. (2017). Spatial clustering of fatal, and non-fatal, suicide in New South Wales, Australia: Implications for evidence-based prevention. *BMC Psychiatry*. 17: 339.
6. **Torok, M.**, Calear, A., Shand, F. & Christensen, H. (2017). Universal public awareness campaigns to reduce suicide behaviours and increase suicide literacy: A systematic review. *Suicide and Life-Threatening Behavior*. 47, 672 – 687.
7. **Torok, M.**, Darke, S., Shand, F. & Kaye, S. (2016). Investigating heterogeneity in violent offending liability among injection drug users from a developmental perspective. *Addictive Behaviors*, 60, 165-70.
8. Batterham, P., **Torok, M.**, Krysinska, K., ... & Christensen, H. (2016). Best strategies for reducing the suicide rate in Australia: Response to Pirkis. *ANZJP*.
9. Krysinska, K., Batterham, P., **Tye, M.**, .... & Christensen, H. (2016). Best strategies for reducing the suicide rate in Australia. *ANZJP*, 50, 115-118.
10. **Torok, M.**, Darke, S., Kaye, S., & Shand, F. (2015). The association of early-life and substance use risks to violent offending among injecting drug users. *Drug and Alcohol Review*, 34, 10 - 17.
11. Darke, Duflou, **Torok, M.** (2015). The health consequences of injecting tablet preparations: Foreign body pulmonary embolization & pulmonary hypertension among deceased injecting drug users. *Addiction*, 110, 1144 – 1151.
12. Darke, S., **Torok, M.** & Duflou, J. (2014) Circumstances and toxicology of sudden or unnatural deaths involving alprazolam. *Drug and Alcohol Dependence*, 138, 61-66.
13. **Torok, M.**, Darke, S., Sand, F., & Kaye, S. (2014). Violent offending severity among injecting drug users: examining risk factors and issues around classification. *Addictive Behaviors*, 39, 1773-8.
14. Darke, S., **Torok, M.** & Duflou, J. (2014). Sudden or Unnatural Deaths Involving Anabolic-androgenic Steroids. *Journal of Forensic Sciences*, 59, 1025 – 1028.
15. Darke, S. & **Torok, M.** (2014). The association of childhood physical abuse with the onset and extent of drug use among regular injecting drug users. *Addiction*, 109, 610 – 616.
16. Kaye, S., Darke, S., & **Torok, M.** (2014). Diversion and misuse of pharmaceutical stimulants among illicit drug users, *Addiction Research & Theory*, 22, 109 – 116.

17. Darke, S., **Torok, M.** & Dufflou, J. Contributory and Incidental blood concentrations in Deaths involving Citalopram. *Journal of Forensic Sciences*, 58, 432-435.
18. Darke, S., Dufflou, J., **Torok, M.** & Prolov, T. (2013) Characteristics, circumstances and toxicology of sudden or unnatural deaths involving very high range alcohol concentrations. *Addiction*, 108, 1411-1417.
19. Kaye, S., Darke, S. & **Torok, M.** (2013). Attention Deficit Hyperactivity Disorder (ADHD) among illicit psychostimulant users: a hidden disorder? *Addiction*, 108, 923-931.
20. McDonald, S., Darke, S., ... **Torok, M.** (2013). Deficits in social perception in opioid maintenance patients, abstinent opioid users and non-opioid users, *Addiction*, 108, 566.
21. Darke, S., Dufflou, J., **Torok, M.** & Prolov, T. (2013) Toxicology, circumstances and pathology of deaths from acute alcohol toxicity. *Journal of Forensic and Legal Medicine*, 20, 1122-1125.
22. Darke, S. & **Torok, M.** (2013). Attitudes of regular injecting drug users towards the legal status of the major illicit drugs, *Drug and Alcohol Review*, 32, 483 - 488.
23. Darke, S. & **Torok, M.** (2013). Childhood physical abuse, non-suicidal self-harm and attempted suicide amongst regular IDUs. *Drug and Alcohol Dependence*, 133, 420-426.
24. Van de Glind, G., Van den Brink, W., Koeter, M. W. J., Carpentier, P.-J., van Emmerik-van Oortmerssen, K., Kaye, S., . . . **IASP Research Group.** (2013). Validity of the Adult ADHD Self-Report Scale (ASRS) as a screener for adult ADHD in treatment seeking substance use disorder patients. *Drug Alcohol Dependence*, 132, 587-596.
25. **Torok, M.**, Darke, S. & Kaye, S. (2012). Attention deficit hyperactivity disorder and severity of substance use: the role of comorbid psychopathology. *Psychology of Addictive Behaviors*, 26, 974–979.
26. Darke, S., McDonald, S., Kaye, S. & **Torok, M.** (2012). Prevalence and correlates of traumatic brain injury amongst heroin users. *Addiction Theory and Research*, 20, 522.
27. Darke, McDonald, Kaye, & **Torok, M.** (2012). Comparative patterns of cognitive performance amongst opioid maintenance patients, abstinent opioid users and non-opioid users. *Drug and Alcohol Dependence*, 126, 309 – 315.
28. Darke, S., Kaye, S., & **Torok, M.** (2012). Age-related patterns of drug use initiation among regular psychostimulant users. *Drug and Alcohol Review*, 31, 784 – 789.
29. **Torok, M.**, Darke, S., Kaye, S. & Ross, J. (2011). Conduct disorder as a risk factor for violent victimisation and offending amongst regular illicit drug users, *J Drug Issues*, 41, 25.
30. Darke, S., **Torok, M.**, Kaye, S., Ross, J. & McKetin, R. (2011). Patterns of psychological distress related to regular methamphetamine and opioid use. *Addiction Research and Theory*, 19, 121-127.
31. Darke, S., Dufflou, J. & **Torok, M.** (2011). Toxicology and characteristics of fatal Oxycodone toxicity cases in New South Wales, Australia 1999-2008. *Journal of Forensic Sciences*, 56, 690-693.
32. **Torok, M.**, Darke, S. & Kaye, S. (2011). Predisposed violent drug users versus drug users who commit violence: does the order of onset translate to differences in the nature of violent offending? *Drug and Alcohol Review*, 31, 558 – 565.
33. Darke, S., **Torok, M.**, et al. (2010). Comparative rates of violent crime amongst regular methamphetamine and opioid users: offending and victimisation, *Addiction*, 105, 916-919.
34. Darke, S., **Torok, M.**, Kaye, S. & Dufflou, J. (2010). Cardiovascular disease risk factors and symptoms amongst regular psychostimulant users. *Drug & Alcohol Review*, 29, 371-377.
35. Darke, S., **Torok, M.**, & Ross, J. (2010). Attempted suicide, self-harm and violence amongst regular illicit drug users. *Suicide & Life-Threatening Behavior*, 40, 587-596.
36. Darke, S., Dufflou, J. & **Torok, M.** (2010). The comparative toxicology and major organ pathology of fatal methadone and heroin toxicity cases. *D & A Dependence*, 106, 1-6.

37. Darke, S., Dufflou, J. & **Torok, M.** (2010). Comparative toxicology of intentional and accidental heroin overdose. *Journal of Forensic Sciences*, 55, 1015-1018.
38. Darke, S., Dufflou, J. & **Torok, M.** (2010). A reduction in blood morphine concentrations amongst heroin overdose fatalities associated with a sustained reduction in street heroin purity. *Forensic Science International*, 198, 1-3.
39. Darke, S., Dufflou, J. & **Torok, M.** (2009). Toxicology and circumstances of completed suicide by means other than overdose. *Journal of Forensic Sciences*, 54, 490-494.
40. Darke, S., Dufflou, J. & **Torok, M.** (2009). Drugs and violent death: comparative toxicology of homicide and non-substance toxicity suicide victims. *Addiction*, 104, 1000-1005.

### **Selected Conference Presentations 2015-2018 (Career total: 18)**

- 2018 Tye, M. The LifeSpan Suicide Prevention trial: evidence-based prevention. Symposium presentation. *2018 Asia Pacific Regional Conference for the International Association for Suicide Prevention*, Bay of Islands: New Zealand.  
Tye, M. LifeSpan and Youth Aware of Mental Health (YAM); *Invited presentation, ProPsych Mental Health in Schools Conference*, Melbourne & Sydney, Australia  
Tye, M. The LifeSpan suicide prevention trial. *17<sup>th</sup> European Symposium for Suicide and Suicidal Behaviour*, Ghent, Belgium.  
Tye, M. Suicide prevention in the school setting: Evidence-based strategies for teachers. *Invited talk, 'From Wisdom to Ways: Enhancing Student Well-Being' Conference*, Children's Hospital Education Research Institute, Parramatta, Sydney.
- 2017 Tye, M. Spatial clustering of fatal, and non-fatal, suicide events in New South Wales: Implications for evidence-based prevention, presented at SMHR conference, Canberra.
- 2016 Tye, M. A systems approach to suicide prevention in NSW. Oral presentation; *7<sup>th</sup> Asia Pacific Regional Conference for the International Association for Suicide Prevention*, Tokyo: Japan. May 18- 21, 2016  
Tye, M. A systems approach to suicide prevention in NSW. Oral poster session, presented at the Brain Sciences Symposium, UNSW Sydney: April 21 2016 (First runner up: Best poster)

### **Social Engagement, Global Impact, Leadership.**

- 2019 - Lead of the Capacity Building in the NHMRC Centre for Research Excellence in Suicide Prevention 2.0 (2018 – 2023).
- 2018 - Founder and chair of the 'Emerge 2.0' academic development and mentoring program at the Black Dog Institute, which provides skills-based training, formalised transdisciplinary mentoring, and dedicated research time to academic students, and early-mid career researchers.
- Current Early Career member on the Black Dog Institute Research Executive Committee, which ensures that BDIs work aligns with our strategic priorities; Key member of the LifeSpan Research and Advisory Committee and Governance Committee.
- 2018 - Leading and contributing to community and public engagements: including Current delivering workshops on evidence-based suicide prevention, and consultation on, and contribution to, evidence improvement initiatives (e.g., NSW Health suicide prevention fund evaluation, productivity commission submission on mental health).
- 2018 - Invited member of a strategic international suicide prevention groups, including Current the Special Interest Group (SIG) for the Development of Effective National Suicide Prevention Strategy and Practice; professional member of six industry-relevant organisations (e.g., Society for Mental Health, Society for Prevention Research).
- 2018 - Regularly contribute expertise for media (e.g., Illawarra Mercury) and contributor Current to opinion editorials (e.g., *Australasian Psychiatry*, *MJA InSight*) to advocate for improvements in evidence-based suicide prevention.
- 2015 - Peer reviewer for >60 papers and >10 grant/fellowship applications (including Current expert review for international grants from the NZ Health Research Council); Academic editor for PLoS ONE.