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Name of the University, Hospital, Research Institute, Academy or Ministry

Curtin University

Name of the Division, Department, Unit, Section or Area

Faculty of Health Sciences

City Bentley **Reference Number** AUS-78

Title WHO Collaborating Centre for Climate Change and Health Impact Assessment

Report Year 02-2024 to 02-2025

1. Annual report on the agreed workplan

Describe progress made on the agreed workplan. For each activity, detail (1) the actions taken, (2) the outputs delivered, as well as (3) any difficulties that may have been encountered. Three responses are expected. [maximum 200 words per activity]. Indicate, if an activity has been completed previously, has not yet started or has been placed on hold.

Activity 1

Title: Support WHO in building capacity of Member States on climate change and Health Impact Assessment
 Description: HIA is an established planning tool for sustainable development in Member States, with many countries having enshrined the requirement for HIA in national and sub-national legislation. The importance of HIA was highlighted as a specific approach in the 2017 Western Pacific Regional Framework for Action on Health and Environment on a Changing Planet.

Building capacity on HIA of Member states supports the For the Future thematic priority on climate change, the environment and health. WHO CC will support WHO's work to strengthen in-country HIA capacity and develop training webinars for small groups of HIA from Member states and relevant stakeholders as indicated by WHO.

Status: ongoing

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WHOCC TOR 1, Activity 1 (37785), Deliverable 1: HIA capacity building

Actions: In-country HIA capacity building as identified by WHO on behalf of its Member States. Deliverable: Training report summarizing outcomes of HIA capacity building held for 15-30 participants on climate change and health impact assessment topics, with an average of one program per year over the designation period. The number of events depend on requests made by WHO Member States.

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1. April: HIA training master class at Curtin University

- * 'Quantitative Health Impact Assessment through an Air Pollution Lens' methods Masterclass featuring presentations by Associate Professor Ivan Hanigan and a visiting Professor from University of Sydney, Geoffrey Morgan, 23rd of April 2024. Curtin University School of Population Health, Perth.

2. Jan-June: Planning and Proposal for Mongolia HIA Capacity Building Project:

- * At regular meetings with our focal point from WPRO, we identified Mongolia as a priority country and discussed potential WHOCC input for HIA capacity building, based on a request made by WHO WPR staff.
- * Developed a draft proposal to initiate discussions, which was expanded upon during bi-monthly meetings throughout 2024.
- * Discussed potential provision of funds for in-country costs and matching co-investment from the Curtin

team's discretionary cost centre.

- * Dr. Pauline Gueutin from the French School of Public Health contributed her expertise in water resource management, designing a data-intensive workshop plan during her visiting fellowship from January to June 2024.
 - * Although the workshop was eventually de-prioritized, the planning process and related artefacts (budget spreadsheets, content development notes, datasets, and slides) have been stored on the shared Curtin University OneDrive.
 - * Difficulties Encountered
 - + Scoping the Topic: The need for systemic thinking.
 - + Logistics and Delivery: Challenges in obtaining in-country contacts and determining the mode of delivery.
3. June: HIA training at NHMRC HEAL future leaders
- * A/Prof Ivan Hanigan was a lead educator for a session "Health Impact Assessment Data sourcing and integration" at the NHMRC HEAL National Network Future Leaders scholarship and will join colleagues in Canberra, June 2024.
4. October: Air Pollution HIA Training in Kuala Lumpur:
- * Delivered in collaboration with UK Centre for Ecology and Hydrology - UKCEH - at the Intercontinental Hotel in KL on 16-18th October.
 - * A/Prof Hanigan's session was part of the first day lecture program which also covered "Introduction to Air Pollution" by UKCEH) "Impact of Air Quality on Human Health" (by WHO ACE) and his presentation on "Quantitative Health Impact Assessment (HIA) Using Air Pollution as a Case Study".
 - * Ivan also held a satellite meeting with the Malaysian Society for Environmental Epidemiology (MySEE), and conducted a seminar/round table discussion on Academic and Research Collaboration with faculty members at the Faculty of Health Sciences, UKM.
 - * Impact and Outcomes
 - + Collaborative relationships established with MySEE resulted in a joint grant application for continued HIA capacity building.
 - + Developed ongoing liaison with Malaysian Ministry of Health, leading to plans for staff placement at Curtin Australia.
 - + Knowledge transfer and capacity strengthening evidenced through participant feedback and follow-up communications.
5. December: Workshop Contribution:
- * Participated in the workshop on "HIA and How Governments Can Use Them" held on Thursday, 12 December 2024, at EPA Victoria, Australia.

Year-round activities

1. Contributing to National and International advocacy (e.g. WHO and UN) to promote Climate Change and HIA in Member States
- * Feb: Dr Aditya Vyas continued advocacy related to the COP28 Health Programme UN climate change negotiations from December 2023. He was responsible for the Solutions Showcase event and Prospectus Report document. These and two other streams of work are summarised in this LinkedIn post: https://www.linkedin.com/posts/adityavyas15_the-un-climate-change-negotiations-cop28-activity-7152809508610752512-wiOs?utm_source=share&utm_medium=member_desktop&rcm=ACoAAA-0wtwB837eUxUOtpPQZwr0iGbA3tVAYvw.
 - * May: Dr Aditya Vyas gave a keynote at the World Congress on Environmental Health 2024 entitled "A new era of environmental health practice for climate resilient health systems" on Thursday, 23 May
 - * June: A/Prof Ivan Hanigan presented "National Level Indicators", International Symposium on Environmental Health Indicators, WHO, South Korea, June 2024, https://www.youtube.com/watch?v=8_HZCraWsaM (T-01:22).
 - * July: A/Prof Ivan Hanigan attended remotely the Lancet Countdown on Climate Change and Health Annual Meeting at the British Medical Association house in London 8th to the 10th of July 2024 to represent members of the Countdown Oceania team. This also served as the kick-off of the Wellcome Trust funded Countdown Phase 2 (five year project).
 - * July: A/Prof Ivan Hanigan chaired the Health Geography session at the Institute of Australian Geographers Health conference in Adelaide (July 2024) and convened the IAG Health Geography

Study Group external workshop the day prior to the conference.

- * August: A/Prof Ivan Hanigan and Dr Aditya Vyas were competitively selected to participate in the consultative workshops for the WHO's Research Agenda for Action on Climate and Health (REACH), two online events on 19 and 21 August 2024. Approximately 40 individuals were selected for the consultative workshops from across the Western Pacific WHO region, and representative of the broad range of stakeholders working on climate change and health solutions.
- * September: A/Prof Ivan Hanigan was an invited speaker to represent the Curtin WHOCC CC&HIA (and as a member of the Asia Pacific Regional Forum on Health and the Environment's Thematic Working Group on HIA) to speak on "Guidelines to implement HIA on addressing the health risks posed by climate change to empower scientific-oriented decision-making", on September 24th at the Scientific Session of the 12th High Level Officials Meeting (HLOM) and 5th Ministerial Meeting (MM) in Jakarta, Indonesia (attending online).
- * September: Dr Lucas Hertzog and A/Prof Ivan Hanigan were invited to represent the WHOCC CC&HIA at the Western Australian Climate Adaptation Research Hub Workshop at the State Library, 12th September 2024 (attending in person).
- * September: A/Prof Ivan Hanigan was invited to present and be a speaker on the panel at the WHOCC Forum (with over 100 WHOCCs) at the WHO Western Pacific Regional Office webinar on "Weaving Health for Families, Communities, and Societies" in Manila, Philippines, 12th September 2024 (attending online).

- Looking Forward

- * Drawing from our 2024 experiences, we've identified strategies to address logistical challenges through earlier engagement with in-country partners and development of hybrid delivery models. For 2025, we anticipate continuing our successful collaboration with MySEE and exploring new opportunities with regional partners.

- Conclusion

- * The training report stipulated as the key deliverable will summarise all outcomes of HIA capacity building and will collate all experiences from these activities over the designation period, allowing for a comprehensive synthesis and identification of lessons learned. This will help inform future initiatives and improve the effectiveness of HIA capacity building efforts.

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WHOCC TOR 1, Activity 1 (37785),

Deliverable 2: Mentoring program "Actions: Mentoring and training webinar for small groups of HIA and health practitioners from Member States. Deliverable: Quarterly mentoring for small groups of HIA and health practitioners (approximately five per group) identified through established and emerging networks as agreed with WHO."

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1. Feb-July: Air pollution in Vietnam: Nguyen Thi Trang Nhung, PhD, Biostatistics Dept. Hanoi University of Public Health, Hanoi, Vietnam. Ivan Hanigan contributed to HIA of fire smoke haze methods up to last email to Ngoc 29/7/2024
2. July: Dr Hertzog presented 'Sustainable Development Indicators in the R programming language' workshop at the Global Dialogue on Sustainable Ocean Development conference in Bali, training individuals from health departments from Australia, Fiji, Indonesia, Malaysia, Ghana, and China.
3. Jul-Nov: Rejuvenation of the HIA Asia Pacific Network through social media activities (<https://www.facebook.com/HIA.network.asia.pac>) and reactivating the HIA Asia Pacific website access for member activities and as a knowledge platform sharing (<https://www.youtube.com/@hianetworkasiapacific4892>)
4. Nov: We have made a strong connection with Dr. Siti Aisah binti Mokhtar: Department of Community Health Faculty of Medicine and Health Sciences Universiti Putra Malaysia (UPM) and Malaysian Society for Environmental Epidemiology (MySEE) Secretary. We assisted her to develop a proposal for a funding grant to develop workshop materials which was to be submitted for the 2025 Malaysia UN-SDG Trust Fund grant application. (last email 1/11/2024)
5. Nov-December: Mentoring Malaysian public health registrars. We collaborated with two public health physicians working with the Malaysian Ministry of Health and candidate in the Environmental Health Subspecialty Programme who requested an attachment at the WHOCC



for six to nine months whereupon completion of the placement, we would provide a certificate of completion or fellowship from our centre as part of the training requirements. Unfortunately several procedural issues were encountered that needed to be resolved, and this required additional time. Given the uncertainties and time constraints, we decided to instead chose the alternative possibility of exploring other options with a Japanese institution.

6. December: At the workshop mentioned above (held at EPA Victoria in Melbourne) we held a meeting with members of the UNSW HIA group (A/Prof Fiona Haigh and Dr Jinhee Kim) and made agreements to work together to provide mentoring services across our networks of HIA practitioners.

Activity 2

Title: Provide technical input and support for WHO's consideration towards its development and dissemination of HIA guidelines that integrate climate change assessments and enable Member States to meet their sustainable development agenda

Description: HIA provides a powerful tool for developing stronger narratives and arguments about the relationship between environmental degradation and health; the role of WHO to support countries in this goal is noted under the thematic priority of climate change, the environment and health (CCE) in the 2020 For the Future white paper. This activity can thus promote Pillar 1 of the WHO-WPRO Strategy Document on CCE by providing advocacy and raising the profile of the CCE agenda by articulating the health co-benefits of actions and policies from non-health sectors, including in Member States' development agenda as assessed by HIA.

Status: ongoing

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WHOCC TOR 1, Activity 2 (37786),

Deliverable 3: New regional HIA guidelines Actions: The WHOCC will provide technical expertise to WHO in generating evidence and drafting publications on integrating climate change within HIA practice, by evolving the methodological toolkit to incorporate comparative risk assessment and burden of disease analysis. This will be informed by draft guidelines for climate change oriented HIA in Western Australia, Solomon Islands, Vanuatu, Nauru and Malaysia as supported by the institution. Deliverable: Literature reviews and information reports for the development of new regional HIA guidelines that integrate climate change assessments.

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1. June: New publications on Monitoring and Evaluation for CC&H. "A/Prof Hanigan and Dr Vyas assisted co-authoring a paper led by Meelan Thondoo and Akeem Ali at WHO ACE in Seoul "Developing a Regional Monitoring and Evaluation Plan for Climate Change an Environmental Health in the Western Pacific Region" which was Unsuccessful to the Bulletin of the World Health Organization. It drew heavily on the Scoping paper we provided to ACE. (It was supposed to go to CCE TAG but did not end up being presented). We uploaded the paper on the OSF portal in accordance with open science principles: Vyas, A., & Hanigan, I. C. (2024). Scoping paper on approaches to monitoring and evaluation (M&E) for climate-health activity in the Western Pacific Region. Retrieved from <https://osf.io/agwt5>
2. December: The Curtin WHOCC was invited to contribute a chapter: "Climate Change Health Impact Assessments" which has been submitted in early 2025, written by Ivan Hanigan and Aditya Vyas. To be published in Edward Elgar 'Handbook on Health Impact Assessment'. Ben Cave, Francesca Viliani, Mirko Winkler (eds). A copy will be provided to accompany this report as an annex.
3. Jan-December: Curtin HDR student Constanze Meier, title: "Supporting LMICs in the West Pacific Region to Achieve Sustainable Urban Development: Developing Evidence-based Tools and Guidelines for Climate Change Health Impact Assessment". In December Constanze successfully converted her MPhil to a PhD.
4. December: Build stronger network of researchers across Curtin University faculty. An aim of the WHOCC in 2024 was to increase awareness and membership across the Curtin University Faculty of Health. On December 3 we hosted a Roundtable Discussion, bringing together researchers from various disciplines to explore potential collaborations for the upcoming year. The event aimed to share the centre's achievements, outline its strategy for the next five years, and discuss how to enhance its outreach. Participants from diverse fields within the school, including geography, exposure science, health science, statistics, economics, and public health, shared insights from their work in different WHO territories. A/Prof Hanigan gave a presentation about the centre's achievements and goals, followed by an open discussion and networking luncheon for potential collaborations and discussing funding opportunities.

Activity 3

Title: Undertake collaborative research and promote technical standards in line with WHO's recommendations to monitor the health impacts of climate change in Member States to mitigate and adapt to changing environments

Description: This activity will support Pillar 3 of the WHO-WPRO Strategy Document on CCE: monitoring the impact of climate change and the environment on health (to provide timely, accurate and strategic information to inform decision-making, guide advocacy, drive action, and track impacts and success of interventions).

Status: ongoing

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WHOCC TOR 2, Activity 3 (37787),

Deliverable 4: Data needs, capacity and infrastructure assessment Actions: undertake an assessment of climate change and health data needs, data analysis capacity and data infrastructure in Member States selected by WHO. Deliverable: Assessments of climate change, "environment" and health data needs, data analysis capacity and data infrastructure for Member States as indicated by WHO.

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1. August: Work with ACE in Seoul, South Korea, to support data needs, capacity and research infrastructure. Ivan Hanigan attended Seoul in August for the strategic planning workshop.
2. October-November: The Malaysian meeting with MySEE mentioned above led to deeper discussions with Dr. Siti Aisah binti Mokhtar (UPM) regarding the data science training she conducts. We also met with members of Curtin's Sarawak Campus in November.
3. December: The NHMRC e-ASIA HEAL-HAZE and Wellcome grants: Thailand, Indonesia, Australia, Laos and Cambodia. Ivan Hanigan is leading the data management plan and data management team meetings. Meeting with Prof. Nguyen Thi Kim Oanh, Director, Environmental Engineering and Management, Department of Water Resources and Environmental Engineering, Air Quality Nexus Center, Asian Institute of Technology (AIT), Thailand.
4. New deployment or coordination of extant monitoring environmental systems. We successfully led the deployment and coordination of continental-scale environmental monitoring systems across Australia, overcoming long-standing jurisdictional barriers between States and Territories. This included establishing a unified Air Quality monitoring database spanning the entire continent. Through direct liaison with WHO ACE staff, we assisted identification of errors in the Australian dataset within the WHO international air quality database. Additionally, we participated in a national network of Australian pollen monitoring scientists who pioneered the implementation of automated, machine learning-based pollen surveillance systems.

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WHOCC TOR 2, Activity 3 (37787),

Deliverable 5: Epidemiological assessments Actions: Support WHO and its Member States in conducting epidemiological assessments to monitor the health impacts of climate change as agreed with WHO and national authorities. Deliverable: Support epidemiological assessments to monitor the health impacts of climate change as indicated by WHO.

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1. May-June. Literature Review to define Exposure-Response functions and requisite datasets for climate and health indicators to support National Climate Change HIA. A team from the WHOCC completed a consultancy to support the establishment of Australia's first National Health and Climate Strategy and Climate Unit within the Department of Health and Aged Care., Commonwealth Department of Health. Report was accepted but remains unpublished. Hanigan, I.C., C., Meier, P., Fernandes, T.A., Han, A., Vyas. Literature review of exposure-response functions for climate change and health impact assessments in Australia. Canberra, Australia: Interim Australian Centre for Disease Control, [Accepted 2024-08-27].
2. June: Support for the WA Health Sector Adaptation Plan (HSAP) which was co-authored by deputy director Aditya Vyas. Director A/Prof Ivan Hanigan and Prof Geoff Morgan developed the box "Co-benefits of climate change mitigation and reducing deaths from air pollution in Western Australia"
3. December: Planning for epidemiological assessments with The NHMRC e-ASIA HEAL-HAZE and Wellcome grants: Thailand, Indonesia, Australia, Laos and Cambodia. Ivan Hanigan is leading the Health Impact and Economic Evaluation team. He hosted meetings with prominent Australian Fire Smoke Epidemiologists including Professor Fay Johnston.
4. Jan-December: Publishing evidence-based research for epidemiological assessments and exposure assessment methods. Representative publications are detailed in an annex.

2. Annual report on other activities requested

Should WHO have requested activities in addition to the agreed workplan, please describe related actions taken by your institution [maximum 200 words]. Please do not include in this report any activity done by your institution that was not requested by and agreed with WHO.

None

3. Resources

Indicate staff time spent on the implementation of activities agreed with WHO (i.e. those mentioned in questions no. 1 and no. 2 above). Do not include any data related to other activities done by your institution without the agreement of WHO. Please indicate staff time using the number of “full-day equivalents” – a day of work comprising 8 hours (e.g. 4 hours work per day for 7 days should be recorded as 3.5 full-day equivalents).

Number of staff involved (either partially or fully)

Senior staff	Mid-career staff	Junior staff, PhD students
2	1	2

Number of full-day equivalents, total for all staff involved

Senior staff	Mid-career staff	Junior staff, PhD students
30	10	10

Implementation of the agreed workplan activities (i.e. those mentioned in questions no. 1 and no. 2 above) normally require resources beyond staff-time, such as the use of laboratory facilities, purchasing of materials, travel, etc. Please estimate the costs of these other resources as a percentage of the total costs incurred (e.g. if you incurred costs of USD 100 and the value of your staff time was USD 50 which makes the total of USD 150, please report 33.3% and 66.7%).

Percentage of costs associated with staff time	Percentage of costs associated with other resources	Total
100.00	0.00	100.00

4. Networking

Describe any interactions or collaboration with other WHO Collaborating Centres in the context of the implementation of the agreed activities. If you are part of a network of WHO Collaborating Centres, please also mention the name of the network and describe your involvement in that network [maximum 200 words].

Dr Aditya Vyas attended the Executive Committee of the Australian Network of World Health Organization Collaborating Centres throughout 2024.

Detailed meetings occurred with WHO Collaborating Centre in Geospatial Disease Modelling at the Telethon Kids Institute in Perth.

The Curtin WHOCC is also a core member and theme lead within the Australian Healthy Environments and Lives (HEAL) and the Centre for Safe Air (CSA) which are National Research Networks (<https://healnetwork.org.au/> and <https://safeair.org.au/>) funded by the National Health and Medical Research Council (NHMRC). The Curtin WHOCC plays an important role in guiding the development of this network and enhancing climate change and health research and practice in Australia and broader Pacific region. Our Director and junior staff Dr. Lucas Hertzog were participating in the 2024 HEAL Future Leaders School on Planetary Health for capacity building.

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ANNEX

Publications related to epidemiological assessments by members of the Curtin WHOCC include:

1. Hanigan, I.C., Yu, W., Yuen, C., Gopi, K., Knibbs, L.D., Cowie, C.T., Jalaludin, B., Cope, M., Riley, M.L., Heyworth, J., Morawska, L., Marks, G.B., Morgan, G.G., and Guo, Y. "Deep Ensemble Machine Learning with Bayesian Blending Improved Accuracy and Precision of Modelled Ground-Level Ozone for Region with Sparse Monitoring: Australia, 2005-2018." *Environmental Modelling & Software* (2025) (<https://doi.org/10.1016/j.envsoft.2025.106378>)
2. M. Sowden, I. Hanigan, D. Robbins, M. Cope, J. Silver, J. Noonan, "Characterizing smoke haze events in Australia using a hybrid approach of satellite-based aerosol optical depth and chemical transport modeling," *Remote Sens.*, vol. 16, no. 7, Apr. 2024, doi: 10.3390/rs16071266.
3. P. Beggs et al., "The 2023 report of the MJA–Lancet Countdown on health and climate change: Sustainability needed in Australia's health care sector," *Med. J. Aust.*, vol. 220, no. 6, pp. 282–303, Apr. 2024, doi: 10.5694/mja2.52245.
4. Butler, C.D., D. Bowles, I.C. Hanigan, A. Harmer and J. Potter "The Lancet Countdown on health and climate change: competing interests and optimism bias [Letter]". *The Lancet*. (2024). [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(24\)01491-0/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(24)01491-0/fulltext)
5. H. R. Stevens, P. L. Graham, P. J. Beggs, and I. Hanigan, "No retreat from the heat: Temperature-related risk of violent assault is increased by being inside," *International Journal of Urban Sciences*, vol. 28, no. 1, pp. 124–139, Jan. 2024, doi: 10.1080/12265934.2023.2209544.
6. Hertzog, L., Charlson, F., Tschakert, P., Morgan, G. G., Norman, R., Pereira, G., & Hanigan, I. C. (2024). Suicide deaths associated with climate change-induced heat anomalies in Australia: A time series regression analysis. *BMJ Mental Health*, 27(1), 1–8. <https://doi.org/10.1136/bmjment-2024-301131>
7. Hertzog, L., Morgan, G., Yuen, C., Gopi, K., Pereira, G., Johnston, F., Cope, M., Chaston, T. B., Vardoulakis, S., Vyas, A., & Hanigan, I. (2024). Mortality Burden Attributable to Exceptional PM2.5 Air Pollution Events in Australian Cities: A Health Impact Assessment. *Heliyon*. <https://doi.org/10.1016/j.heliyon.2024.e24532>
8. Bone, A., Bos, A., Vyas, A., Wyns, A., Armstrong, F., Bragge, P., & Capon, A. (2024). Health system responses to climate change in Australia. In J. Braithwaite, Y. Zurynski, & C. K-lynn (Eds.), *Routledge Handbook of Climate Change and Health System Sustainability* (pp. 110-129). Taylor & Francis. <https://doi.org/10.4324/9781032701196-15>
9. Bayart, N. - E., G. Pereira, C. Reid, S. D. Nyadanu, O. Badamdorj, B. Lkhagvasuren, and K. Rumchev. 2024. "Effects of outdoor air pollution on hospital admissions from cardiovascular diseases in the capital city of Mongolia." *Atmospheric Pollution Research*. DOI 10.1016/j.apr.2024.102338
10. Rumchev, K., N. - E. 1. Bayart, C. Reid, C. M. Nyadanu, and G. Pereira. 2024. "Association between Short-Term Exposure to Ambient Air Pollution and Mortality from Cardiovascular Diseases in Ulaanbaatar, Mongolia." *Atmosphere*. DOI 10.3390/atmos15091110.
11. Borchers-Arriagada, N., G. Morgan, J. Van Buskirk, K. Gopi, C. Yuen, F. Johnston, Y. Guo, M. Cope, and I. Hanigan. 2024. "Daily PM2.5 and Seasonal-Trend Decomposition to Identify Extreme Air Pollution Events from 2001 to 2020 for Continental Australia Using a Random Forest Model." *Atmosphere*. <https://doi.org/10.3390/atmos15111341>
12. Gebremedhin, A. T., S. D. Nyadanu, I. C. Hanigan, and G. Pereira. 2024. "Maternal exposure to bioclimatic stress and hypertensive disorders of pregnancy in Western Australia: identifying potential critical windows of susceptibility." *Environmental Science and Pollution Research* 31 (39): 52279-52292. DOI <https://doi.org/10.1007/s11356-024-34689-6>
13. Borchers-Arriagada, N., S. Vander Hoorn, M. Cope, G. Morgan, I. Hanigan, G. Williamson, and F. H. Johnston. 2024. "The mortality burden attributable to wood heater smoke particulate matter (PM2.5) in Australia." *Science of the Total Environment* 921. DOI <https://doi.org/10.1016/j.scitotenv.2024.171069>.

Additional research was presented in the following conferences.

- Hertzog, L., Makate, M., Chipanta, D., Banougnin, B., Mchenga, M., Pereira, G., Nyadanu, S., Dunne, J., Tallman, P. S., Collins, S., Alene, K., Rousseau-Gueutin, P., Mavisakalyan, A., & Hanigan, I. (2024a). Drought and sexual violence against adolescent girls: Evidence from a multi-country study. In *Australian Public Health*



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Conference, Perth, Australia.

- Hertzog, L., Charlson, F., Tschakert, P., Morgan, G. G., Norman, R., Pereira, G., & Hanigan, I. C. (2024b). Heat Anomalies and Suicide in Australia: A time-series regression analysis (2000-2019). In HEAL Conference.