

# Assessing violence and injury prevention plans, strategies and indicators in eighteen Pacific Islands countries: an environmental scan



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## Summary

**Background** Similar to many other resource poor settings, due to competing priorities, injury is often neglected in the Pacific Islands despite being a prevalent cause of death and disability. This study identifies, and synthesises existing plans and strategies, and assesses progress against indicators for the prevention of violence and injury in 18 Pacific Islands nations to identify gaps and highlight opportunities.

**Methods** An environmental scan of known government repositories and Google Advanced was conducted to identify publicly available documents describing/evaluating national-level injury prevention strategies and plans in the Pacific Islands. Data were extracted on the strategy/plan, country, government department responsible, indicators and related progress.

**Findings** We identified 44 relevant documents. Most were published in more resourced countries (e.g., Fiji, Cook Islands) and described strategies/plans relating to traffic injury, injury from natural disaster and/or intimate partner violence. No strategies/plans to prevent injury mechanisms of drowning, falls, suffocation, burns, or electrocution were identified. Progress against only one indicator was reported for road traffic injury in the Commonwealth of the Northern Mariana Islands.

**Interpretation** This study suggests that there would be benefit in Pacific Islands nations to develop more robust data systems to assess progress against indicators of existing strategies and plans for traffic-injury, natural disaster and intimate partner violence. Development of strategies and implementation plans to address neglected injury areas such as drowning and falls which account for a significant burden of injury in the Pacific Islands is also recommended.

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## Introduction

Pacific Islands nations face an increased risk of injury due to factors such as geographical isolation, climate change, and natural disasters.<sup>1</sup> In 2019, 8% of deaths in Pacific Islands countries resulted from injury (primarily road traffic injury, falls, drowning or violence),<sup>2</sup> though the quality of data systems likely means the burden is underestimated. These injuries are largely preventable

through targeted investment in evidence-based interventions and strategies. To date, injury prevention has been largely overlooked in global and Pacific Island national development agendas, including the Sustainable Development Goals (SDGs). The SDGs address road traffic injuries in relation to goal 3 (health and wellbeing) and goal 11 (creating safe and sustainable cities) but do not encompass other injury mechanisms

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### Research in context

#### Evidence before this study

We systematically searched six academic databases for peer-reviewed articles published between January 2018 and September 2022 that described and/or evaluated violence and/or injury prevention plans and strategies in eighteen Pacific Islands countries. Fourteen studies were identified most of which focused on suicide, intimate partner violence or road injury. From the peer-reviewed evidence it is unclear whether plans, strategies and indicators are in place to address other high burden injury mechanisms such as drowning, workplace accident, assault, falls and exposure to natural disaster.

#### Added value of this study

This is the first study to synthesise publicly available information on existing violence and injury prevention plans, strategies and indicators in the Pacific Islands. Injury prevention efforts appeared to be concentrated in more resourced Pacific Islands countries like Fiji, Papua New Guinea, and Vanuatu. Many of these countries had road safety,

gender-based violence and/or disaster preparedness plans, strategies or indicators in place, though these were rarely implemented, nor progress evaluated. No plans or strategies focused on, or addressing, drowning, falls, suffocation, burns, and electrocution were identified.

#### Implications of all the available evidence

Together with existing evidence, these findings suggest drowning, falls, suffocation, burns, and electrocution need to be prioritised in national health policies, as a conduit for stand-alone plans and strategies addressing the full range of injury mechanisms. This involves investing in Pacific-led development of evidence-based interventions for these injury mechanisms. Our findings also suggests that better data systems are needed to guide plan and strategy goal development, as well as assess progress in reducing injury-related mortality and morbidity. We recommend Pacific Island countries establish a knowledge exchange to facilitate regional collaboration and sharing of best practices to improve violence and injury prevention.

such as drowning (goal 13 climate action), and violence against women (goal 5 gender equality)<sup>3</sup> (see [Supplementary File 1](#) for a full list of the SDGs).

The SDGs provide a blueprint for addressing global challenges relating to socio-economic equality, prosperity, health, justice, and environmental protection.<sup>4</sup> However, for the SDGs to have impact, government action is required to mobilise local resources (including funding, infrastructure, and human resources) to address the SDGs, in a way that is innovative and tailored to the unique needs of communities.<sup>5</sup> National governments also play a critical role in facilitating partnerships between multiple levels of government, the private and community sector, and in doing so addresses goal 17 (partnerships).<sup>6</sup> Governments are increasingly developing national plans which articulate their strategies for addressing the SDGs most relevant to their context and the indicators against which progress will be measured.<sup>7</sup> Articulating, measuring and evaluating development strategies holds national governments accountable to the SDGs.<sup>8</sup>

The World Health Organization (WHO) collaborated with Pacific Islands governments to establish national policies and action plans for injury prevention under the WHO Cooperation Strategy 2018–2022.<sup>9</sup> This has been challenging as many Pacific Island countries do not have reliable injury data to guide decision making. The WHO's Global Health Estimate database indicates that only 4 of 15 Pacific Islands countries have publicly available injury statistics.<sup>2</sup> Available data indicate a vastly different injury burden across Pacific Island nations. The Federated States of Micronesia reports a fatal drowning rate of 15.13 per 100,000 population, with very low rates of road injury

(0.16). Tonga reports the highest road injury rate at 32.95 per 100,000 population, but the second lowest drowning rate (4.27). Rates of self-harm deaths are extremely high in countries such as Kiribati and the Federated States of Micronesia (28.3 and 28.2, respectively) yet significantly lower in Papua New Guinea (2.95).<sup>10</sup> Despite these data challenges, there seems to be a growing interest in developing comprehensive injury data systems within emerging non-communicable disease plans.<sup>11</sup>

Global agendas need to be coupled with more targeted strategies to track progress against Pacific Islands specific indicators at the regional and national level.<sup>7</sup> The Pacific Islands Forum Secretariat have set sustainable development targets and associated indicators for the region.<sup>12</sup> This regional strategy has only set targets and indicators for traffic injury, work-related falls, and gender-based violence. Further, it is unclear which Pacific Islands countries have national plans, strategies, and indicators in place to address the different injury mechanisms prevalent in the Pacific Islands.

#### Aim

The aim of this study is to identify and review the plans, strategies, and indicators for the prevention of violence and injury in 18 selected countries in the Pacific Islands.

#### Methods

##### Study design

This data is a secondary analysis of work commissioned by the World Health Organization Regional Office for the Western Pacific, reproduced with permission. An environmental scan methodology was used to systematically

search publicly available websites for documents on violence and/or injury prevention in the Pacific Islands.<sup>13</sup> Environmental scan methodology is useful for synthesising knowledge on current violence and injury prevention efforts to understand gaps and guide policy and practice.<sup>14</sup> Ethics approval was not required for this secondary analysis of publicly available data.

### Inclusion and exclusion criteria

Eligible documents were included if they: 1) provided information about a plan, strategy and/or indicator for violence and/or injury prevention; 2) related to residents or tourists of eighteen Pacific Island countries [Commonwealth of Northern Mariana Islands (CNMI), Cook Islands, the Federated States of Micronesia, Fiji, French Polynesia, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Tuvalu]. These 18 countries were chosen as they are classified as ‘developing’ in the WHO Country Cooperation Strategy<sup>9</sup>; 3) Date range: published since 2002, 4) freely accessible at the time of the search and 5) written in English or French language (for the four countries where French is the main language spoken; French Polynesia, New Caledonia, Vanuatu and Wallis and Futuna). The exclusion criteria for documents were: 1) access fee, 2) described an intervention for food poisoning, surgical injury, or sunburn, 3) non-English or French language (in the four previously mentioned countries) 4) described guidelines for injury prevention.

### Search strategy

A two-staged search was conducted for each of the 18 countries: 1) purposive search of known government repositories; and 2) a systematic Google Advanced search. A hierarchical approach was used to first look for injury strategies embedded in national health plans, followed by injury-specific plans and then extract relevant indicators, and progress against those indicators.

#### Government repositories

Two authors (RB and AP) conducted a manual Google Advanced search of each country’s governance structure and compiled a list of government departments ([Supplementary File 2](#)) potentially relevant to violence and/or injury prevention based on professional knowledge. For each government department website, we searched a) tabs/sections on the home page with potential relevance to injury prevention b) the resources sections (e.g., policies, strategies, publications, legislation—different for each site) c) other government agencies/sub-departments identified from our search.

#### Google Advanced

The first author (RB) conducted all searches in Google Advanced on January 18th, 2023, limited to country region and PDF file format. This enabled the identification of

documents published outside of government repositories either by non-government organisations, churches, private organisations (e.g., insurance companies) or government agencies. The search included 24 terms (see [Supplementary File 3](#)) relating to the 12 intentional and unintentional injury mechanisms categorised in the ICD-11. These included unintentional injury mechanisms (transport injury, fall, drown, suffocation, burn, poisoning, blunt-force trauma, electrocution) and intentional injury mechanisms (assault, self-harm, suicide). Assault encompasses interpersonal violence, including gender-based violence and different forms of intimate partner violence (sexual, psychological, physical).<sup>15</sup> For the four countries where French was the main language spoken, the same terms were translated in French and searched in Google Advanced with a further French language limit applied (see [Supplementary File 3](#)).

### Data extraction and synthesis

RB and AP independently dual screened a random 10% subset of retrieved documents against inclusion/exclusion criteria to check for accuracy on the 25th of February 2023. Discrepancies were settled by consensus. RB singled screened the remaining documents, a decision based on the high interrater agreement, time and resources constraints and aligned with the PRISMA guidelines and other environmental scans.<sup>16,17</sup>

RB extracted data for all included documents using a predefined Excel codebook. AP independently extracted data for 10% of documents as a quality check. Descriptive data were extracted including:

- Country
- Injury mechanism targeted: ICD-11 codes were used to delineate and define 12 injury mechanisms.<sup>15</sup>
- Department overseeing the strategy, plan or indicator.
- Timeframe: a strategy/plan relevant to 2023 and beyond was considered current. If it did not include 2023 it was considered out of date.
- Indicators: an indicator is defined as a quantifiable measure of the extent to which the intervention has had its intended impact on injury prevention in the long-term (more than 1 year).<sup>18</sup>
- Reported progress against indicators: presented as it appeared in the included record.

A mixed methods approach was used for data synthesis. We first quantified the number of strategies, plans or indicators for each injury mechanism by country. We then provided a narrative summary of recorded strategies, plans and indicators and interpreted gaps.

### Role of the funding source

This work is a secondary analysis of data collected with the support of funding provided by the World Health Organization Regional Office for the Western Pacific

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**Results**

The search yielded 2703 unique documents after 19 duplicates were removed. Forty-four documents were eligible for inclusion. The PRISMA flow chart (Fig. 1) outlines the screening process. Supplementary File 4 provides the URLs for all included documents. The most common reasons for exclusion were: 1) no strategy, plan or indicator (64%), 2) not related to injury (33%) or 3) published prior to 2002 (3%).

Countries with the highest to lowest number of included documents were Fiji (N = 8), Cook Islands (N = 6), Vanuatu (N = 6), Papua New Guinea (N = 5), Solomon Islands (N = 5), CNMI (N = 4), Samoa (N = 4), Kiribati (N = 3), Palau (N = 2), Tuvalu (N = 2) and Niue (N = 1). No eligible documents were identified from the Federated States of Micronesia, French Polynesia, The Marshall Islands, Nauru, New Caledonia, Tonga or Wallis and Futuna.

**Injury in national health plans**

We examined the extent to which Pacific Islands countries integrated injury prevention into their national health plans. As seen in Table 1, we identified six

countries with current (encompassing 2023 and beyond) national health plans: the Federated States of Micronesia, Fiji, New Caledonia, Papua New Guinea, Samoa and Solomon Islands. The Solomon Islands national health plan was briefly described on the Ministry of Health’s website not accessible in an online form and could not be included in analysis. The Federated States of Micronesia’s national health plan was mentioned in the WHO Country Cooperation Strategy but not publicly available for analysis.

We conducted a frequency search of the 12 ICD coded injury terms. Fiji’s national health plan most frequently mentioned injury resulting from exposure to natural disaster, followed by road traffic injury assault, and suicide. New Caledonia’s national health plan did not mention injury. Papua New Guinea mentioned blunt force trauma and assault. Samoa mentioned exposure to extreme forces of nature, self-harm, blunt force trauma, poisoning, assault, suicide, road traffic injury, and falls (Table 1). Fig. 2 illustrates which countries have current, out of date, or no health plans that mention injury.

**Unintentional injury plans/strategies**

No plans/strategies were identified for the injury mechanisms of suffocation, burns, drowning, electrocution, or poisoning prevention in any of the eighteen countries. No current plans/strategies to address any unintentional

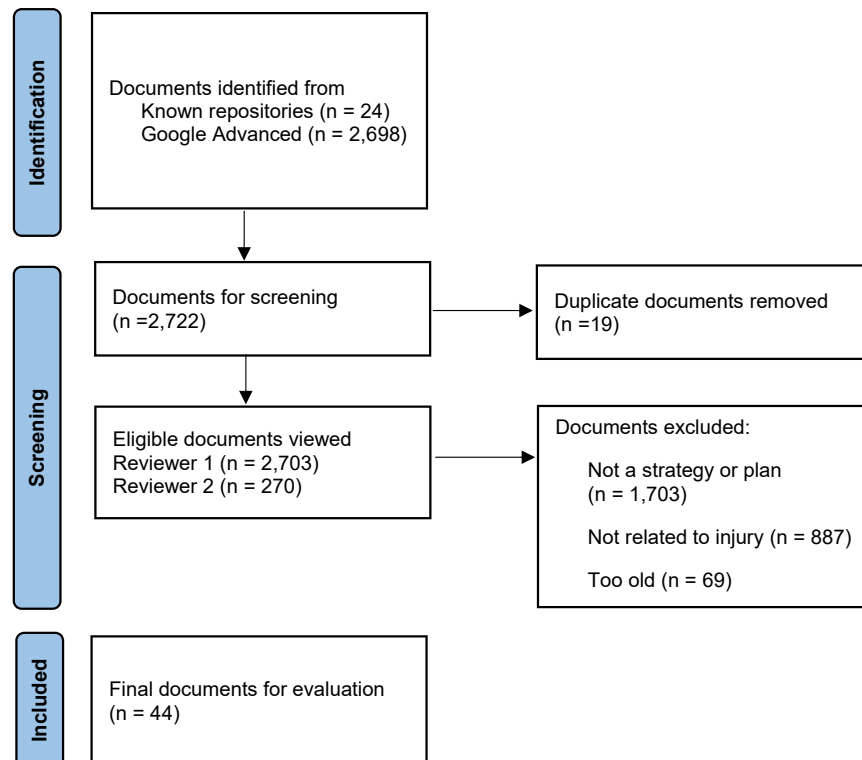


Fig. 1: PRISMA flowchart illustrating screening process.

| Country                                      | National health plan (Y/N) | Years covered (bold = current, italic = out of date) | Injury type          |      |       |             |                   |           |                    |               |                                      |                    |           |         |   |
|--|----------------------------|--|----------------------|------|-------|-------------|-------------------|-----------|--------------------|---------------|--------------------------------------|--------------------|-----------|---------|---|
|  |                            |  | Unintentional injury |      |       |             |                   |           |                    |               |                                      | Intentional injury |           |         |   |
|  |                            |  | Road traffic injury  | Fall | Drown | Suffocation | Burn or frostbite | Poisoning | Blunt-force trauma | Electrocution | Exposure to extreme forces of nature | Assault            | Self-harm | Suicide |   |
| Commonwealth of the Northern Mariana Islands | Y                          | 2015–2020  | 0                    | 0    | 0     | 0           | 0                 | 0         | 0                  | 0             | 0                                    | 0                  | 0         | 0       | 0 |
| Cook Islands                                 | Y                          | 2017–2021  | 2                    | 1    | 0     | 0           | 1                 | 7         | 17                 | 0             | 7                                    | 7                  | 8         | 17      |   |
| Federated States of Micronesia               | Y                          | 2014–2024  | 0                    | 0    | 0     | 0           | 0                 | 0         | 0                  | 0             | 0                                    | 0                  | 0         | 0       |   |
| Fiji   | Y                          | 2020–2025  | 3                    | 0    | 0     | 0           | 0                 | 0         | 0                  | 0             | 5                                    | 4                  | 0         | 2       |   |
| French Polynesia                             | N                          |  |                      |      |       |             |                   |           |                    |               |                                      |                    |           |         |   |
| Kiribati                                     | N                          |  |                      |      |       |             |                   |           |                    |               |                                      |                    |           |         |   |
| the Marshall Islands                         | N                          |  |                      |      |       |             |                   |           |                    |               |                                      |                    |           |         |   |
| Nauru  | Y                          | 2016–2020  | 0                    | 0    | 0     | 0           | 0                 | 0         | 0                  | 0             | 1                                    | 0                  | 0         | 0       |   |
| New Caledonia                                | Y                          | 2015–present   | 0                    | 0    | 0     | 0           | 0                 | 0         | 0                  | 0             | 0                                    | 0                  | 0         | 0       |   |
| Niue   | N                          |  |                      |      |       |             |                   |           |                    |               |                                      |                    |           |         |   |
| Palau  | N                          |  |                      |      |       |             |                   |           |                    |               |                                      |                    |           |         |   |
| Papua New Guinea                             | Y                          | 2021–2030  | 0                    | 0    | 0     | 0           | 0                 | 0         | 1                  | 0             | 0                                    | 1                  | 0         | 0       |   |
| Samoa  | Y                          | 2019–2029  | 2                    | 1    | 0     | 0           | 0                 | 1         | 4                  | 0             | 11                                   | 1                  | 11        | 4       |   |
| Solomon Islands                              | Y                          | 2022–2031  |                      |      |       |             |                   |           |                    |               |                                      |                    |           |         |   |
| Tonga  | Y                          | 2015–2020  | 15                   | 0    | 0     | 0           | 0                 | 0         | 0                  | 0             | 2                                    | 1                  | 0         | 0       |   |
| Tuvalu                                       | Y                          | 2016–2019  | 1                    | 0    | 0     | 0           | 0                 | 0         | 0                  | 0             | 0                                    | 0                  | 0         | 0       |   |
| Vanuatu                                      | Y                          | 2017–2020  | 8                    | 1    | 0     | 0           | 0                 | 1         | 0                  | 0             | 3                                    | 0                  | 6         | 0       |   |
| Wallis and Futuna                            | N                          |  | 0                    | 0    | 0     | 0           | 0                 | 0         | 0                  | 0             | 0                                    | 0                  | 0         | 0       |   |

Table 1: Frequency of injury-related key words in National Health plans for country.

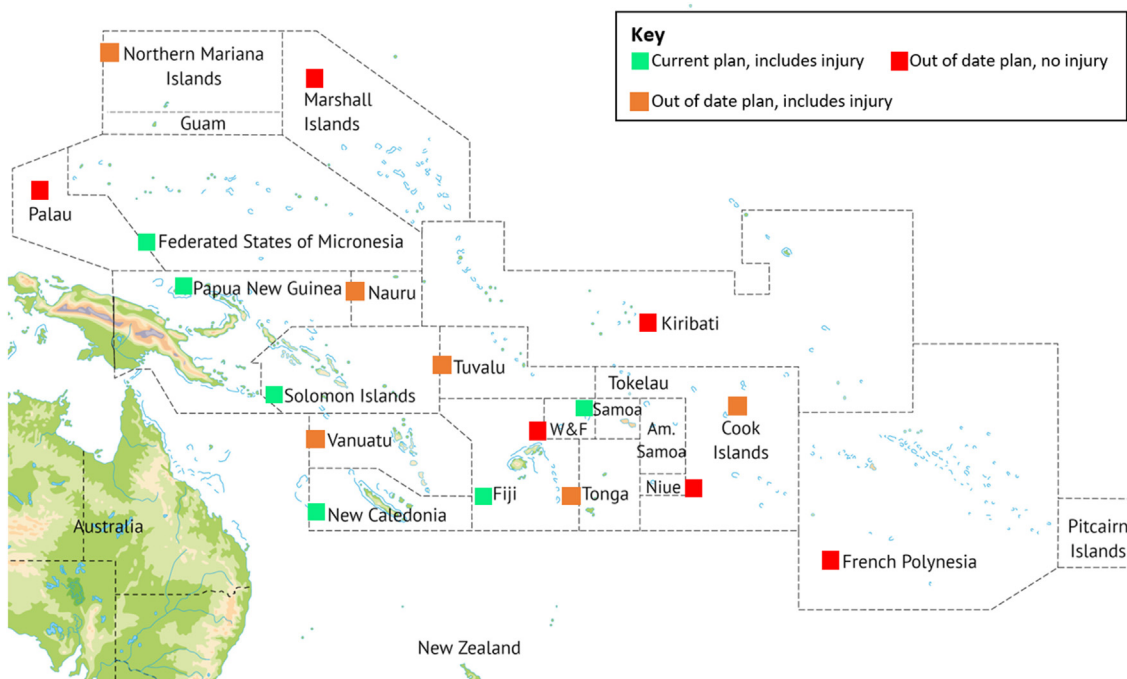


Fig. 2: Map highlighting which Pacific Islands countries have current, out of date or no health plans mentioning injury.

| Country          | Road traffic injury |               |   | Fall          |               |   | Blunt-force trauma |               |                          | Disaster/extreme forces of nature |               |  |
|------------------|---------------------|---------------|---|---------------|---------------|---|--------------------|---------------|--------------------------|-----------------------------------|---------------|--|
|                  | Current (Y/N)       | Years covered | Gov. body year  | Current (Y/N) | Years covered | Gov. body year  | Current (Y/N)      | Years covered | Gov. body year           | Current (Y/N)                     | Years covered | Gov. body year   |
| CNMI             | N                   | 2022          | Department of Public Safety, 2021                                   |               |               |   |                    |               |                          | Y                                 | 2020–2024     | Office of Planning and Development, 2021   |
| Cook Islands     | N                   | 2016–2020     | Ministry of Health, 2020  |               |               |   |                    |               |                          | N                                 | 2017–2018     | Ministry of Education, 2017  |
|                  |                     |               |   |               |               |   |                    |               |                          | Y                                 | 2019–2024     | Office of the Prime Minister, 2019   |
| Fiji             | N                   | 2011–2020     | Fiji Roads Authority, 2016  |               |               |   |                    |               |                          | N                                 | 2013–2017     | Ministry of Health, 2014   |
|                  | Y                   | 2015–2030     | Fiji Roads Authority, 2014  |               |               |   |                    |               |                          | Y                                 | 2020–2024     | Ministry of Waterways and Environment Republic of Fiji, 2020                       |
| Kiribati         | Y                   | 2021–2024     | Ministry of Information, Communication, Transport and Tourism, 2021 |               |               |   |                    |               |                          | N                                 | 2012          | Office of the President, 2012  |
| Niue             | Y                   | 2017–2026     | Ministry of Infrastructure, 2018                                    |               |               |   |                    |               |                          |                                   |               |  |
| Palau            | Y                   | 2021–2030     | Ministry of Finance, 2021   |               |               |   |                    |               |                          | N                                 | 2016–2018     | Office of the President, 2016  |
| Papua New Guinea | N                   | 2014–2018     | Department of Transport, 2013                                       |               |               |   |                    |               |                          | Y                                 | 2017–2030     | National Disaster Council, 2018  |
|                  | Y                   | 2010–2030     | Department of National Planning and Monitoring, 2010                |               |               |   |                    |               |                          |                                   |               |  |
| Samoa            | N                   | 2011–2016     | Ministry of Finance, 2011   | N             |               |   | N                  | 2008–2018     | Ministry of Health, 2018 | N                                 | 2017–2020     | Public Service Commission, 2018  |
| Solomon Islands  | Y                   | 2019–2023     | Ministry of Infrastructure Development, 2018                        | Y             | 2022–2027     | Ministry of Provincial Government and Institutional Strengthening, 2021 |                    |               |                          | Y                                 | 2018–2023     | Ministry of Environment, Climate Change, Disaster Management and Meteorology, 2018 |
| Tuvalu           | N                   | 2012–2022     | Department of Planning, 2012  |               |               |   |                    |               |                          | Y                                 | 2021–2030     | Ministry of Finance, 2020  |
| Vanuatu          | Y                   | 2015–2024     | Department of Strategic Policy, Planning and Aid Coordination, 2015 |               |               |   |                    |               |                          | Y                                 | 2016–2030     | Secretariat of the Pacific Community, 2015   |
|                  |                     |               |   |               |               |   |                    |               |                          |                                   | 2015–2024     | Department of Strategic Policy, Planning and Aid Coordination, 2015                |

Table 2: Unintentional injury specific plans/strategies.

injury mechanisms were identified in The Federated States of Micronesia, French Polynesia, the Marshall Islands, Nauru, New Caledonia, Tonga or Wallis and Futuna. Table 2 presents the unintentional injury types for which plans/strategies were identified in other countries.

Nine countries (CNMI, Cook Islands, Fiji, Kiribati, Niue, Palau, Papua New Guinea, Solomon Islands, Vanuatu) had a current transport injury plan/strategy in place. These were mostly governed by the Ministry of Transport, Infrastructure and/or Finance and focused on improving transport infrastructure, legislation for vehicle safety and promoting safe driving through public education and/or mass media campaigns.<sup>19–21</sup> Seven countries (CNMI, Cook Islands, Fiji, Papua New Guinea, Solomon Islands, Tuvalu, Vanuatu) had a current plan/strategy to prevent injury from natural disaster. These plans/strategies were mostly a

collaboration between different government departments such as the Ministry of Environment/Ministry of Planning and Office of the President. These plans/strategies focused on injury resulting from climate change and included training, emergency communication, infrastructure (such as evacuation shelters), education and awareness, risk assessment, and investing in research on climate change adaptation.<sup>22,23</sup>

The Solomon Islands had an active falls prevention plan in place, governed by the Ministry of Provincial Government and Institutional Strengthening and the Ministry of Environment, Climate Change, Disaster Management and Meteorology. The plan used training and infrastructure (such as rails and barriers) to prevent occupational injuries related to falls.<sup>24</sup> One blunt-force trauma prevention strategy was identified in Samoa but was out of date (2008–2018).<sup>25</sup>

| Country          | Assault       |               |  | Self-harm     |               |                          | Suicide       |               |  |
|------------------|---------------|---------------|--|---------------|---------------|--------------------------|---------------|---------------|--|
|                  | Current (Y/N) | Years covered | Gov. body year   | Current (Y/N) | Years covered | Gov. body year           | Current (Y/N) | Years covered | Gov. body year                           |
| CNMI             | Y             | 2021–2030     | Office of Planning and Development, 2021                       |               |               |                          | Y             | 2021–2030     | Office of Planning and Development, 2021 |
|                  | Y             | 2022–2024     | Department of Community and Cultural Affairs, 2021             |               |               |                          |               |               |  |
| Cook Islands     | Y             | 2019–2024     | Ministry of Internal Affairs, 2020                             |               |               |                          | N             | 2016–2020     | Ministry of Health, 2017                 |
| Fiji             | Y             | 2014–now      | Ministry for Social Welfare, Women & Poverty Alleviation, 2014 | N             | 2015–2019     | Ministry of Health, 2018 | N             | 2015–2019     | Ministry of Health, 2018                 |
|                  | N             | 2017–2036     | Ministry of Economy, 2017                                      |               |               |                          |               |               |  |
|                  | N             | 2015–2019     | Ministry of Health, 2018                                       |               |               |                          |               |               |  |
|                  | N             | 2010–2012     | Ministry of Health & Medical Services, 2017                    |               |               |                          |               |               |  |
| Kiribati         | N             | 2011–2021     | Ministry for Internal and Social Affairs, 2010                 |               |               |                          |               |               |  |
| Papua New Guinea | Y             | 2010–2030     | Department of National Planning and Monitoring, 2010           |               |               |                          |               |               |  |
|                  |               | 2016–2030     | Ministry for Religion, Youth & Community Development, 2016     |               |               |                          |               |               |  |
| Samoa            | Y             | 2021–2026     | Ministry of Women, Community and Social Development, 2022      |               |               |                          |               |               |  |
| Solomon Islands  | N             | 2016–2020     | Ministry of Women Youth Children and Family Affairs, 2016      |               |               |                          |               |               |  |
|                  | N             | 2019–2021     | Royal Solomon Islands Police Force, 2019                       |               |               |                          |               |               |  |
| Vanuatu          | Y             | 2016–2026     | Ministry of Justice and Community Services, 2020               | N             | 2016–2020     | Ministry of Health, 2020 | N             | 2016–2020     | Ministry of Health, 2020                 |

Table 3: Intentional injury and violence specific plans/strategies.

### Intentional injury specific plans/strategies

Table 3 presents the Pacific Islands countries found to have current plans/strategies in place to prevent different types of intentional injury. Six countries (CNMI, Cook Islands, Fiji, Papua New Guinea, Samoa, and Vanuatu) had assault prevention plans/strategies in place. These were mostly developed and coordinated by the Ministry of Health and/or Ministry of Internal Affairs/Ministry of Women with a focus on violence against women. Plans/strategies to prevent violence against women included legislation to improve referral pathways, investment in better domestic and family violence data systems, education and awareness, and community training.<sup>19,26</sup>

The CNMI had a current suicide prevention plan in place,<sup>27</sup> led by the Ministry of Health. The suicide prevention plan provided counselling, access to support hotlines, outreach, education and peer support groups to people (particularly youth) at-risk of/or experiencing suicide crisis. The plan also provided information and training for community partners. Two countries (Fiji and Vanuatu) had self-harm plans/strategies that were out of date, governed by their Ministry of Health. The outdated self-harm strategies included legislation to improve the rights of people with mental illness, investment in mental health care, investing in the provision of support services to those at risk of/experiencing self-harm and training service providers.<sup>28</sup>

No plans/strategies to prevent assault, self-harm, or suicide were found in the following countries: The Federated States of Micronesia, The Marshall Islands,

Nauru, New Caledonia, Niue, Palau, Tonga, Tuvalu or Wallis and Futuna.

### Indicators: unintentional injury

Out of the 9 countries that had road injury strategies/plans (Table 4), 5 (CNMI, Cook Islands, Fiji, Niue, Papua New Guinea, PNG, Samoa) had defined impact indicators, and only 1 (CNMI) measured progress against those indicators. The CNMI defined their plan to reduce the number of traffic fatalities from 3.2 to 2 by December 2021, and reported meeting this target as there were 2 traffic fatalities in 2020.<sup>19</sup> Road injury strategy plans in the Cook Islands and Fiji similarly defined reductions in the rate of traffic fatalities as impact indicators, although progress was not reported. Plans/strategies in Niue and Papua New Guinea aimed to reduce the number of traffic crashes, but again progress against these indicators was not reported.

Neither of the two countries with falls plans/strategies reported impact indicators. One of the two countries (Samoa) with a plan to prevent blunt-force trauma had an indicator. The Samoan health sector plan aimed to decrease rates of children brought to hospital suffering from injuries (primarily from blunt-force trauma).<sup>25</sup> However, the decrease rate was not quantified, and progress was not measured against.

Although 7 countries had a disaster-related injury prevention plan in place, only Papua New Guinea had indicators for this plan. The Papua New Guinea National Disaster Risk Reduction Framework (2017–2030)



| Country          | Transport injury (including road) |  |  | Blunt-force trauma       |  |                                 | Disaster/extreme forces of nature  |           |                   |
|------------------|-----------------------------------|--|--|--------------------------|--|---------------------------------|--|-----------|-------------------|
|                  | Gov. body year                    | Indicator  | Progress reported  | Gov. body year           | Indicator  | Progress reported               | Gov. body year   | Indicator | Progress reported |
| CNMI             | Department of Public Safety, 2021 | Reduce number of traffic fatalities from 3.2 to 2 by December, 2021<br>Reduce serious traffic injuries from 10 to 8 by December, 2021        | CNMI had 2 traffic fatalities in 2020; therefore has met the target<br>CNMI had 4 serious injuries in 2020. 2021 performance not reported. |                          |  |                                 |  |           |                   |
| Cook Islands     | Ministry of Health, 2020          | 50% reduction in the number of serious injuries by 2020<br>Zero road incident/crash-related deaths   |  |                          |  |                                 |  |           |                   |
| Fiji             | Fiji Roads Authority, 2016        | Reduce the annual fatalities from 8 per 10,000 vehicles to 4 per 10,000 vehicles by 2020, and a reduction in accident numbers by 5% annually |  |                          |  |                                 |  |           |                   |
| Niue             | Ministry of Infrastructure, 2018  | Reduce the number of crashes   |  |                          |  |                                 |  |           |                   |
| Papua New Guinea | Department of Transport, 2013     | Reduce transport accidents   |  |                          |  | National Disaster Council, 2018 | - Reduce number of deaths attribute to disasters per 100,000 population (2020–2030 compared to 2005–2015)<br>- Reduce number of injured people attributed to disasters |           |                   |
| Samoa            |                                   |  |  | Ministry of Health, 2018 | Decreasing rates of children brought to hospital suffering from injuries |                                 |  |           |                   |

Table 4: Unintentional injury specific indicators.

aimed to reduce the number of deaths and injuries from disasters per 100,000 population (2020–2030 compared to 2005–2015). Progress has not been reported against these indicators, but this could be because the plan is still in its infancy.

### Indicators: intentional injury

Seven countries had assault prevention plans/strategies in place (Table 5), and six of these (CNMI, Cook Islands, Fiji, Papua New Guinea, Samoa, Solomon Islands) had indicators in place to measure intended impact. Vanuatu was the country missing indicators for its child assault prevention plan. Most assault plans/strategies aim to reduce the proportion, rate, or incidence of domestic violence (N = 5), particularly violence against women (N = 5). Additionally, the CNMI's Comprehensive Sustainable Development Plan aims to reduce the number of suspected homicides and Fiji's national development plan (Ministry of Health, 2018) aims to reduce assault relating to violence. Progress against these indicators has not been reported for any assault prevention plans/strategies.

Fiji's national development plan also targets a reduced rate of self-harm per 100,000 population,

however progress against this indicator has not been reported. The CNMI, Cook Islands, and Fiji have set targets to reduce the number of deaths by suicide, however progress has not been reported.

### Discussion

This environmental scan identified 44 publicly available documents detailing plans, strategies, or indicators for violence/injury in the Pacific Islands. Countries were most likely to have plans and strategies in place to prevent road traffic injury followed by injury by assault and natural disasters. Consistent with prior research,<sup>29</sup> our scan highlighted existing gaps in injury data, likely limiting indicator development and subsequently the extent to which progress could be evaluated.

Fifty percent of countries had plans or strategies in place to prevent road injury through education or the provision of infrastructure. This was consistent with Pacific-led researcher recommendations to invest in road infrastructure,<sup>30</sup> road safety campaigns, legislation for vehicle safety and first aid training for drivers<sup>31</sup> across the Pacific Islands. International organisations (e.g., World



| Country          | Assault  |   |                   | Self-harm                |   |                          | Suicide  |  |                   |
|------------------|--|---|-------------------|--------------------------|---|--------------------------|--|--|-------------------|
|                  | Gov. body year   | Indicator   | Progress reported | Gov. body year           | Indicator   | Progress reported        | Gov. body year   | Indicator  | Progress reported |
| CNMI             | Office of Planning and Development, 2021   | <ul style="list-style-type: none"> <li>- Reduce the number of suspected homicides under investigation annually</li> <li>- Reduce the proportion of the population experiencing reported physical, psychological, or sexual violence annually.</li> </ul>  |                   |                          |   |                          | Office of Planning and Development, 2021   | <ul style="list-style-type: none"> <li>- Reduce the suicide mortality rate per 100,000 from 15.4 to 14</li> <li>- Reduce the percentage of high school students who actually attempted suicide in the past year by 10% of the rate reported in 2019</li> </ul> |                   |
| Cook Islands     | Ministry of Internal Affairs, 2020   | <ul style="list-style-type: none"> <li>- Decreased in the rate of domestic violence</li> <li>- Reduction of incidence of domestic violence</li> <li>- Reduction of incidence of VAW</li> </ul>  |                   |                          |   | Ministry of Health, 2017 | <ul style="list-style-type: none"> <li>- 50% reduction in the suicide rate by 2020</li> <li>- 20% reduction in the suicide attempt rate by 2020</li> </ul> |  |                   |
| Fiji             | Ministry of Health, 2018   | <ul style="list-style-type: none"> <li>- To reduce the prevalence of violence and injuries by 5% by 2019</li> <li>- To reduce reported cases of violence and injuries related to alcohol by 10% by 2019</li> </ul>  |                   | Ministry of Health, 2018 | Reduced rate of intentional self-harm, not including suicide (per 100,000 population) |                          | Ministry of Health, 2018   | <ul style="list-style-type: none"> <li>- To reduce number of suicides by 20% by 2019</li> <li>- To reduce cases of attempted suicide by 20% by 2019</li> </ul>   |                   |
| Papua New Guinea | Department of National Planning and Monitoring, 2010<br><br>Ministry for Religion, Youth & Community Development, 2016 | <ul style="list-style-type: none"> <li>Number of crimes fall by 55%; victimisation rate below 5%</li> <li>- 30% of reported GBV cases are effectively dealt with through the referral and justice systems by 2019, 40% by 2022, and 60% by 2025.</li> <li>- Annual percentage of survivors effectively engaged in livelihood programmes, private and public sector (10% by 2019, 30% by 2022, 50% by 2025)</li> </ul> |                   |                          |   |                          |  |  |                   |
| Samoa            | Ministry of Women, Community and Social Development, 2022  | <ul style="list-style-type: none"> <li>- Reduced percentage of women, people with a disability, elderly and youth who have been physically assaulted</li> <li>- Reduced percentage of women, people with a disability, elderly and youth who have been sexually assaulted</li> <li>- Reduced percentage of children at risk</li> </ul>  |                   |                          |   |                          |  |  |                   |
| Solomon Islands  | Ministry of Women Youth Children and Family Affairs, 2016  | <ul style="list-style-type: none"> <li>- Monitoring and Evaluation of the National Policy to Eliminate Violence Against Women and Girls 2016–2020</li> </ul>  |                   |                          |   |                          |  |  |                   |

Table 5: Intentional injury indicators.

Bank, Asian Development Bank), non-government organisations (e.g., Bloomberg Philanthropies) and donor countries (e.g., UK Aid) have responded to these recommendations and prioritised funding for road traffic injury prevention.<sup>32</sup> Looking ahead, Pacific-led research is needed to evaluate the effectiveness of the road injury plans and strategies identified in this scan, while improvements to data systems may identify other countries within the region who would benefit from strategically addressing this high burden injury mechanism. Some

countries, like Palau, have identified a lack of national-level funding as a barrier for road injury prevention, and would benefit from Pacific-led advocacy for this investment.<sup>33</sup>

Given the growing risk of injury resulting from climate change in the region,<sup>34</sup> we identified efforts to prevent injury from natural disaster but no evidence of evaluation. This suggests disaster-related injury prevention might be a new area of public health focus as there is a lag between intervention implementation and

peer-reviewed evaluation. Future researchers should engage key stakeholders (government departments, targeted populations) in evaluations of existing natural disaster prevention plans and strategies from conception to dissemination, as well as ensure high burden disaster-related injury mechanisms, such as drowning,<sup>35</sup> are incorporated into disaster risk reduction and climate adaptation strategies across the region.<sup>36</sup>

Most countries had plans/strategies in place to prevent assault, primarily focused on IPV towards women. This was consistent with evidence of promising interventions for IPV towards women in the peer-reviewed literature. In Samoa, a drama-based education intervention for IPV in Samoan young people was reported to improve awareness of warning signs and available responses to such violence.<sup>37</sup> Other IPV prevention interventions, such as mediation and behavioural strategies<sup>38,39</sup> have been implemented but not yet tested for effectiveness. Taken together, these findings highlight a gap in prevention efforts for other types of interpersonal assault such as parental violence towards children<sup>40</sup> and physical bullying.<sup>41</sup> There is a need to invest in early school-based interventions targeting children and adolescence to prevent perpetration/victimisation of interpersonal violence later in life.

A likely explanation for why plans/strategies addressing IPV towards women are most prevalent in the Pacific Islands is because this injury mechanism has been prioritised by external funders. The World Bank, Asian Development Bank and Australian Government have provided increasing budgetary support towards the elimination of gender-based violence in the Pacific Islands.<sup>42</sup> There is also a need to understand how IPV towards women gained traction as a priority area for funding, so this process can be replicated for other high burden injury mechanisms in the region.

This scan did not identify any plans/strategies to prevent suffocation, burns, drowning, poisoning or electrocution. Considering that the Western Pacific Islands accounted for a third of global drowning deaths in 2019, this highlights a substantial gap in drowning prevention efforts.<sup>36</sup> It is however possible that drowning prevention plans/strategies have been put in place but not articulated in publicly available documents. Further research involving semi-structured interviews with government stakeholders could be useful for identifying potential plans, strategies and indicators that are unpublished.

Only the CNMI had a current suicide prevention plan in place, despite evidence that other Pacific Islands (Kiribati, Samoa and Solomon Island) have the highest rates of youth suicide globally.<sup>43</sup> This is further evidence of a gap in at-scale suicide prevention interventions in the Pacific Islands region.<sup>29</sup> Several suicide prevention interventions have been proposed including school-based education to promote awareness in Kiribati, Samoa and Tuvalu<sup>44</sup>; investment in

adolescent mental health in Fiji, Kiribati, Samoa, Solomon, Tonga and Vanuatu<sup>45</sup>; and efforts to reduce unemployment in Federated States of Micronesia, PNG and Samoa.<sup>46</sup> The development of comprehensive suicide prevention plans would support the implementation of these promising interventions. Further, we did not identify current self-harm plans or strategies. This could be related to limitations classifying self-harm as a type of injury or issues with poor data quality identified in a prior review.<sup>29</sup> The burden of self-harm could also be under-reported given stigma and shame are known barriers to accessing mental health services in the Pacific Islands.<sup>47</sup> Public health advocates need to emphasise the burden of self-harm to donors to encourage further investment in the development and trial of prevention plans and strategies that destigmatise self-harm.

There is a need for government stakeholders to work with populations at high risk of injury (such as young males, and lower socio-economic groups among others) to co-develop plans/strategies<sup>48</sup> for injury mechanisms found to be neglected in this study. We recommend focusing on preventing drowning, falls, self-harm, and assault outside of domestic and family violence. Future research needs to consider how self-harm prevention interventions can be developed to be culturally acceptable for young males in Pacific Islands who likely face heightened help-seeking barriers of shame and stigma around mental health compared to their Western counterparts.<sup>29</sup> Similarly, whilst first aid training has been found to be an effective drowning prevention intervention in high-income countries,<sup>49</sup> further research is needed to understand how it can be adapted to be culturally acceptable in LMICs like the Pacific Islands.<sup>50</sup> Further, we recommend international donors direct more external funding towards high burden injury mechanisms.

Pacific Islands countries could establish a knowledge exchange on best practices to design, enact and evaluate evidence-based injury prevention plans and strategies. Countries with the existing plans and strategies (such as Fiji) could lead this exchange and share success stories. Knowledge exchanges have been established between Pacific Islands nations to address other non-communicable diseases (NCDs) such as obesity,<sup>51</sup> including an NCD policy toolkit.<sup>52</sup> Additionally, the Pacific Monitoring Alliance for NCD Action (MANA) was established to offer Pacific Islands nations regional technical expertise, capacity support, and mutual accountability, aiming to enhance their NCD monitoring systems.<sup>51</sup> These regional partnerships strengthened national-level action for non-injury issues, with learnings that can be applied to injury and violence. While action at the government level on prevention of injury-related harms is key, we would encourage any knowledge exchange to also incorporate work on injury prevention within the non-government sector.

Our findings showed that injury data were rarely used to assess the effectiveness of existing plans and strategies against predetermined indicators. Only one country (CNMI) had evaluated a plan/strategy for road traffic injury, despite most countries having road traffic injury plans/strategies with specified indicators. Moreover, the disaster-related injury prevention plans/strategies we identified rarely had indicators of success. We hypothesise this is due to inadequate collection of comprehensive data on injuries caused by natural disasters.<sup>53</sup> Lastly, while plans/strategies targeting intimate partner violence consistently included clearly defined indicators, the measurement of progress against these indicators was lacking. This highlighted a potential limitation in the data systems pertaining to injury caused by IPV. There is a need for Pacific Island countries to develop more robust indicators to monitor existing injury plans and strategies. The first step to achieving this is to strength data systems particularly those recording injury from natural disaster and self-harm as has been seen in Palau, with data system improvements leading to more informed care and streamlined reporting to the Ministry of Health.<sup>54</sup>

Finally, most of the indicators identified for assault measured prevalence, whereas road-injury indicators mostly assessed number of injuries/deaths (frequency). Indicators that assess prevalence or incidence are more reliable than those that assess crude frequency<sup>55</sup> and should be prioritised in efforts to measure progress towards SDG targets. Individual governments should strengthen their data systems to calculate the national incidence of road-related-injury and set incidence indicators for existing and emerging strategies and plans.

### Strengths and limitations

This study had a number of strengths. First, its novelty, as the first known study to examine plans, strategies, and indicators of injury prevention in the Pacific Islands region. Second, its comprehensive scope, as it encompassed plans and strategies for 12 injury mechanisms across 18 countries. Third, three injury prevention stakeholders from different countries (CNMI, Palau, Fiji) were involved in interpreting and reporting the data, increasing our confidence that our findings reflect the true state of injury prevention in the Pacific Islands region. Fourth, we followed a systematic environmental scan methodology with dual screening to increase rigor (followed an environmental scan methodology). Fifth, we went beyond identifying strategies to extracting data on progress against achieving those strategies, increasing the significance of our findings for synthesising current action towards injury in the Pacific Islands.

There were several limitations to consider. First, we excluded non-English and non-French language documents, as we did not have resources for translation. This could have limited our findings from countries in the

region who spoke additional languages. However, our French language search in the four French speaking countries did not yield any additional documents. Additionally, meta-analyses have found language restrictions have little intervention effects,<sup>56,57</sup> however we encourage replication of this study in additional languages spoken in the region. Second, our search took a national rather than regional approach, meaning we could have potentially missed Pacific-wide strategies. However, a strength of the study was it advanced understandings of gaps in plans, strategies, and indicators in specific countries. Third, we only included publicly available documents and acknowledge we could have missed internal government detailing existing plans, strategies and progress against indicators, as well as documents published prior to 2002. Fourth, our exclusion of guidelines on the basis that these documents exist to operationalise plans and strategies may have resulted in relevant information not being included. Fifth, our focus was on the presence and absence of plans, strategies and indicators at the government level. We recommend further research to identify the existence of such initiatives within the non-governmental sector. Sixth, our search was restricted to explicit injury terms, meaning we could have missed broader strategies/plans that indirectly prevented injury. Lastly, 90% of documents were single coded, which could have undermined the credibility of our findings. It is common for a single coder to screen most of the documents once interrater agreement is established in studies like this led by early career researchers with resource constraints.<sup>16,58</sup>

### Conclusion

This environmental scan provided a comprehensive understanding of existing plans, strategies, and indicators of injury prevention in the Pacific Islands region. There are lessons to be learned from successful Pacific-led road injury and assault injury prevention that can be applied to co-design plans and strategies for more neglected injury areas such as drowning, falls and self-harm. An important first step to developing new plans and strategies is to strengthen systems for collecting epidemiological injury data. There also appears to be a clear opportunity for a Pacific-wide and Pacific-led knowledge exchange to drive a coordinated regional effort to enhance plans and strategies around injury prevention.

### Contributors

AP and RB conceptualised the study. RB with assistance from AP ran the searches and extracted the data. RB wrote the first draft with all other authors reviewing and critically revising the manuscript. All authors approve the submitted version.

### Data sharing statement

Data are available upon reasonable request to the corresponding author via email (AP; [a.peden@unsw.edu.au](mailto:a.peden@unsw.edu.au)).

**Editor note**

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**Declaration of interests**

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**Appendix A. Supplementary data**

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.lanwpc.2023.100985>.

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