# GHHIN Synthesis Report

1. **Scope and Purpose of the Report**

The GHHIN Global Heat Health Synthesis report will be published on a bi-annual basis, every 2 years to synthesize the state of science and practice to monitor, predict, and address extreme heat risks to human health.

The report will help to establish baseline conditions confronting the heat-health community (on exposure/information systems for decision making/response etc.) and help track progress in our learning and responses over time; highlight knowledge, action, and research gaps; and provide an authoritative voice upon which members can advocate more effectively. It will be presented in an accessible format with key figures, focused case studies, and visualization to engage a broad readership.

The GHHIN synthesis is different from a scientific review. It will draw on the scientific literature and align with standing and special reports of IPCC, WMO State of Climate, Lancet Tracking Change, etc. However, its unique nature will highlight local initiatives and learning from the GHHIN Member base, which may not be published in the peer-reviewed literature. In order to do this, the GHHIN synthesis will draw heavily on member inputs to the web portal and what is reported and learned during the bi-annual forums about new research, initiatives, events, outcomes, indicators, and other items. These three activities will need to work in tandem – and its for this reason a common framework is desirable to help synchronize information flow.

The first synthesis report will draw upon a stocktaking exercise completed by the steering committee. In the future the member driven portal and annual forums will serve as a content/data collection opportunities to inform the synthesis report.

Overall goals:

1. To help harmonize the characterisation and track the magnitude and heterogeneity of hazards, exposure, vulnerability, impacts, and global response capacity.
2. To draw out and articulate evidence based key messages, emerging and pressing issues needing advocacy, investment, and attention.
3. To accelerate global learning about risk reduction, which is not waiting on the scientific literature process – but can provide a credible high profile venue to showcase and draw upon member information – bringing to light in success stories, national progress which may otherwise go unnoticed.

1. To identify and document scientific progress - observational and surveillance, process study, biomedical, climate and multidisciplinary research, and information needs to improve decision making for more effective action.
2. **Proposed Structure**

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| **Sections** | **Content Description** | **Key indicators** |
| **Executive Summary** | **Key Messages and Emerging Issues**  Drawn from summation of contents below. Bias toward showcasing headline figures, key successes and remaining gaps.   1. Statement on mitigating climate change vs. managing risks 2. key figures draw on contents from other chapters and are easy to update and display as a sort of dashboard upfront. | Regional dimensions  Country dimensions |
| **Introduction to GHHIN and the Report** | What is GHHIN  Why is it needed  How it works  Synthesis report scope/purpose |  |
| **Chapter 1 –**  **Heat: a human health hazard** | 1. **Status:** ***What is the magnitude and dimensions of the problem?*** Global overview of observed status and latest projections of global heat hazards. 2. **Analysis: *How are dangerous heat conditions are changing?*** Describe relevant trends, climate drivers such as ENSO, or notable regional and country dimensions (e.g. where air quality magnifies the health hazard) 3. ***What do we need to know?* Science-Information- Decision-making:** Availability and skill to forecast and predict EHE. 4. **Sharing Experience:** Case Study of member experience predicting hazardous conditions/creating warnings | Should reference key standing scientific reports and processes. |
| **Chapter 2 –**  **Heat Exposure** | 1. **Status: Who is exposed to increasing temperatures and EHE*?***  * Framing: relative nature of dangerous exposure * Provide key indicators, figures and maps of regions, populations at risk, urban heat islands. * **Status update:** (future reports) summary of changes detected in key indicators and new knowledge about global exposure.  1. **Analysis: Trends and tracking change:** Highlights new findings regarding understanding and monitoring changing human exposures to heat. (source: new publications of previous 2yr). 2. ***What do we need to know?* Science-Information- Decision-making:** Availability, access, and use of knowledge about exposure.   (source: members)   1. **Sharing Experience:** Case Study of member experience characterizing local exposure. (source: members) | *Need to decide on specific parameters:*   * key global thresholds and related indicators for extreme heat * exposure to annual mean temperature change (positioning extremes in the trend) * exposure to heatwaves (proposed: >95% T-Avg relative to 1981-2010 for 2+ days) * heat index relevant for labour productivity   *Alignment with Lancet Indicators* |
| **Chapter 3 - Human vulnerability** | 1. **Status *Who is vulnerable to heat, where, when?***  Baseline understanding of global vulnerability to negative health impacts. 2. **Status update:** (future reports) summary of changing vulnerability indicators over the past 2 year reporting period. (source: new publications). 3. **Analysis**: Discuss how vulnerability is changing? Maps of how are drivers of vulnerability changing (e.g. Urbanization. Aging. Migration. Energy Access). 4. **(option) Feature:** Reports may want to rotate featured vulnerable populations with more in-depth coverage of workers, elderly etc. Ask key questions? E.g. What we can expect from acclimatization. Where are the limits? 5. ***What do we need to know?* Science-Information- Decision-making:** Availability, access, and use of knowledge about vulnerability   - highlight what indicators of vulnerability are/could be available at national, sub-national levels?   1. **Sharing Experience:** Case Study of member experience characterizing/studying vulnerability | Key Indicators Regional dimensions  Country dimensions |
| **Chapter 4 –Human Health Impacts** | 1. **Status:** ***How is heat affecting people?***   Summarizes global literature as baseline. Describes types of direct impacts, but reference to indirect impacts   1. Provide key impact figures: *key indicators and sources to track, morbidity, mortality, productivity, etc* 2. (future reports) **Status update:** summary of changing impact indicators over the past 2 year reporting period. (source: new publications). 3. **Analysis:** Are impact trends changing? What can be said of future impacts? 4. ***What do we need to know?* Science-Information- Decision-making:** Availability, access, and use of knowledge about impacts   - highlight what indicators of impacts are/could be available at national, sub-national levels   1. **Sharing Experience**: Case Study snapshot characterizing or forecasting impacts.(source: members) | (identify key sources to build on e.g. emdat.be) |
| **Chapter 5 – Heat Health Warning Systems (HHWSs)** | 1. **Status:** ***What is being done to predict and classify extreme heat events (EHEs)?***   Baseline understanding of what is being done predict and classify EHEs, derived from national/regional/global HHWSs   1. Provide key mechanisms of HHWSs: *key metrics and definitions of EHEs* 2. (future reports) **Status update:** summary of new and updated HHWSs (source: new publications). 3. **Analysis:** How effective are HHWSs once they’re being used? *Skill, advance timing, trigger threshold methodology,* 4. ***What do we need to know?* Science-Information- Decision-making:** Availability, access, and use of knowledge about HHWSs  * *provide framework for detailing what a HHWS consists of*  1. **Sharing Experience:** Case Study snapshot characterizing effective/new HHWS (source: members) |  |
| **Chapter 6 –Responses and Risk Management** | 1. **Status:** ***What is being done to reduce risk of increasing and extreme heat?***   baseline understanding of what is being done to reduce risks (source: stocktaking)  (future reports) **Status update:** will track changing implementation and investments (source: new publications + member inputs to database over the past 2 year reporting period)   1. ***(Gap Analysis) Risk : Response Equation – based on the data base relative to known risks where is action needed, and what kind of action.*** 2. ***What do we need to know?* Science-Information- Decision-making:** Availability, access, and use of knowledge about interventions   - highlight what indicators of effectiveness are/could be available at national, sub-national levels.   1. **Sharing Experience:** Case Study snapshot characterizing local action (source: members) | Contributes to SDG Indicators |
| **Chapter 7 – Innovations** Feature chapter for learning from members | * Advances in science and application- showcase new approaches to heat forecasting, disease surveillance, notable new interventions, new collaborations, etc. (source: new publications + member inputs to database/forum) * Experience: Lessons: Member voice/lesson sharing Commentary on what is being reported as effective (or what is not) |  |
| **Chapter 8 –**  **Gaps and Recommendations** | Synthesis and focus on knowledge/information needs to make better decisions, as well as political and action.   * critical data and observations used and needed, * research and communication * needs for action * advocacy; |  |
| **References** | Glossary of Key Terms |  |

*Should the report make recommendations or spotlighting needs?*

* *Do we need a summary for policy makers, practitioners, media?*

1. **Bi-annual Production Process**

While acknowledging that the production of any report requires significant dedicated effort, with enough ongoing investment in monitoring and reporting to the web portal and forum, hopefully a bulk of the data collection will be automated/organized before authors even begin discussing the synthesis. For this reason the common framework is very desirable.

**Target Publication Date**: September 2018 and every two years thereafter (2020, 2022, etc)

* **Dec-Feb**: collection and synthesis of data for the preceding period (calendar years 2016 & 2017) This long lead time is because we may draw on many sources that do their own compilation and need a few months after the close of the previous year to publish their data.
* **Feb-March**: preparation of the report
* **April-May**: review and revision
* **June – September** : publication production

Publication Target to Align with other Policy and Reporting Processes: Notably, Lancet Tracking Climate and Health (annual Oct/Nov), WMO State of the Climate (Impacts section)(annual Oct/Nov release pre-COP), IPCC AR6. Outreach to research funding agencies and institutions, to the earth observation community, and to key international organizations (IPCC, WMO, WHO)