Agenda

- Background
- WASH indicators
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- Trends/findings
- Limitations
Background

• Access to safe drinking water and sanitation are human rights, conferring benefits to human wellbeing beyond their substantial impact on health.

• Unsafe water and sanitation were the first and second leading risk factors for under-5 mortality from diarrhoeal diseases, respectively, and contributed to over 530 000 under-5 child diarrhoeal deaths globally in 2017.

• These risks increase vulnerability to the spread of infectious agents that cause diarrhoea, including *Vibrio cholera*.

• Despite substantial expansion of access during the MDG era, less than 75% of the population in many countries in sub-Saharan Africa and south and southeast Asia had access to improved facilities in 2017.
WASH Indicators

- Water and sanitation indicators are defined by the WHO-UNICEF Joint Monitoring Programme.

- Water:
  - Piped
  - Improved
  - Unimproved
  - Surface

- Sanitation:
  - Sewer or Septic
  - Improved
  - Unimproved
  - Open Defecation

- This schema yields mutually exclusive and collectively exhaustive indicators.
## Data sources

<table>
<thead>
<tr>
<th>Country</th>
<th>Water Sources</th>
<th>Sanitation Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Tanzania</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

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### Additional Information

- **Kenya**: Includes 22 water sources and 20 sanitation sources.
- **Ethiopia**: Features 9 water sources and 13 sanitation sources.
- **Tanzania**: Consists of 12 water sources and 12 sanitation sources.
- **Zimbabwe**: Contains 5 water sources and 4 sanitation sources.

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Water Access: Kenya

Access to piped water (%)

Access to improved water sources (%)
Sanitation Access: Kenya
Water Access: Ethiopia

2017

Access to piped water (%)  
0  50  100

Access to improved water sources (%)  
0  50  100

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Sanitation Access: Ethiopia
Water Access: Tanzania
Sanitation Access: Tanzania
Water Access: Zimbabwe

Access to piped water (%) 2017

Access to improved water sources (%) 2017
Sanitation Access: Zimbabwe

[Maps showing sanitation access data for Zimbabwe in 2017]
Zimbabwe Sanitation: Cholera Hotspots vs. National Mean

Mean Sanitation by Cholera Hotspot Type

National Mean Sanitation

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Zimbabwe Water Access: Cholera Hotspots vs. National Mean

Mean Water Access by Cholera Hotspot Type

National Mean Water Access

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Distribution of Piped Water Access by Hotspot Type, Zimbabwe

N.B.: Red line denotes the country mean
Distribution of Open Defecation Prevalence by Hotspot Type, Zimbabwe

N.B.: Red line denotes the country mean
Distribution of Sewer or Septic Sanitation Access by Hotspot Type, Zimbabwe

N.B.: Red line denotes the country mean
Limitations

- This analysis focused on access by facility type classification (figure 1), and therefore our estimates provide a best-case scenario for the SDGs (all improved facilities are safely managed and provide basic services).
- These results may not fully represent intra-urban disparities in water and sanitation.
- Resampling polygon data to points could result in smoothed estimates in areas with predominantly areal data.
- Only covariates available at a high-spatial resolution and not strongly correlated with our current suite of covariates were incorporated.
- Our data do not capture the impacts of recent conflicts or climate change-related weather events.
- Survey data in our models are subject to known biases and inaccuracies in reporting, and these issues coupled with data scarcity in some locations may affect the accuracy of our estimates.
- Uncertainty is not explicitly incorporated from the survey data or the intermediate covariates generated from our stacking procedure due to computational limitations.