**Technical Report: Global Water Pollution & Disease Intervention Study**

**1. Outline**

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**2. Introduction**

**Objective of the Project:**  
This study aims to assess the impact of global water pollution on public health indicators such as access to sanitation, healthcare, clean water, and disease prevalence. The objective is to uncover key correlations and provide actionable interventions.

**Problem Being Addressed:**  
High rates of waterborne diseases and poor sanitation access in many countries continue to affect public health. The study investigates the relationships between water pollution, access to essential resources, and infant mortality.

**Key Datasets and Methodologies:**  
The analysis used data from multiple sheets in Microsoft Excel covering healthcare access, water contaminant levels, and bacteria treatment effectiveness. Pivot tables and charts were utilized to summarize and visualize trends.

**3. Story of Data**

**Data Source:**  
The data originate from an international water and health monitoring program, focusing on selected countries and regions.

**Data Collection Process:**  
Data was compiled from government records, international health organizations, and field surveys, though specific sources are not stated.

**Data Structure:**  
The data is organized by country, year, water source type, region, and treatment method. Key metrics include sanitation coverage, bacteria count, healthcare access, and diarrhoea cases.

**Important Features and Their Significance:**

* **Sanitation Coverage**: Indicator of public infrastructure.
* **Healthcare Access**: Proxy for disease management capability.
* **Bacteria Count & Treatment**: Measure water safety and intervention efficacy.
* **Diarrhea Cases**: Reflect impact of water pollution on health.

**Data Limitations or Biases:**  
Some sheets have aggregated averages, limiting granular analysis. Also, country selection may not represent global diversity fully.

**4. Data Splitting and Preprocessing**

**Data Cleaning:**  
The data was pre-organized with minimal cleaning required. Headings were standardized for consistency.

**Handling Missing Values:**  
No significant missing data was observed. Where blanks existed, rows were excluded from analysis.

**Data Transformations:**  
Averages were computed across time ranges; new fields like "Top Country by Metric" were derived from comparative calculations.

**Data Splitting:**  
Dependent variables: health outcomes (diarrhoea cases, infant mortality). Independent variables: sanitation, clean water access, contaminant levels.

**Industry Context:**  
This work pertains to public health and environmental safety, critical in both developing and developed nations.

**Stakeholders:**  
Policy makers, NGOs, public health agencies, and water treatment organizations.

**Value to the Industry:**  
Improving intervention strategies and prioritizing funding based on evidence-backed insights.

**5. Pre-Analysis**

**Key Trends:**

* China leads in sanitation coverage (66.96%) and clean water access.
* Boiling proves most effective in reducing bacterial presence.
* 2023 recorded the highest infant mortality.

**Potential Correlations:**

* Poor sanitation correlates with high diarrhoea incidence.
* Improved healthcare access aligns with reduced infant mortality.

**Initial Insights:**  
Regions with better clean water and healthcare access fare significantly better in public health indicators.

**6. In-Analysis**

**Unconfirmed Insights:**

* Central and South regions show elevated diarrhoea cases despite average sanitation coverage, suggesting other hidden variables.
* Pond water shows highest contaminant levels, reinforcing link to illness rates.

**Recommendations:**

* Expand sanitation infrastructure in Ethiopia and Pakistan.
* Promote boiling as the primary bacteria treatment method in high-risk areas.

**Analysis Techniques Used in Excel:**  
Pivot tables for summary stats, slicers for filtering, and dynamic charts to display trends across regions and years.

**7. Post-Analysis and Insights**

**Key Findings:**

* A significant drop in infant mortality occurred from 2023 to 2024 (55.26 to 47.63).
* Pond water is the most contaminated source (avg. 5.08).
* South region has the highest average diarrhoea cases (258.7).

**Comparison with Initial Findings:**  
Initial suspicions about water source quality were validated. However, the degree of improvement in some areas (e.g., infant mortality) was unexpected.

**8. Data Visualizations & Charts**

The dashboard includes:

* Bar charts for sanitation coverage, clean water access, and healthcare.
* Pie charts and donut visuals for regional diarrhoea distribution and bacteria treatments.
* Line graph showing infant mortality trend.

Each chart directly connects to specific insights, making it accessible to non-technical stakeholders.

A close-up of a graph

AI-generated content may be incorrect.

**9. Recommendations and Observations**

**Actionable Insights:**

* Prioritize intervention in pond-reliant communities.
* Encourage low-cost water treatment methods like boiling.
* Invest in healthcare access especially in Nigeria and Mexico.

**Optimizations or Business Decisions:**

* Governments can redirect funding to sanitation and clean water projects.
* NGOs should focus on community-level training for water purification.

**Unexpected Outcomes:**

* Some countries (e.g., Pakistan) have high healthcare access but still face disease burden, implying inefficiencies.

**10. Conclusion**

**Key Learnings:**  
Water pollution directly affects disease prevalence and infant mortality. Treatment methods matter, and regional disparities must be addressed.

**Limitations:**  
Limited time range and scope of countries. More granular data would allow better causal inference.

**Future Research:**

* Expand dataset to include economic indicators.
* Study long-term impact of sanitation programs.

**11. References & Appendices**

**References:**

* Internal dashboards and Excel data sheets (2024)

**Appendices:**

* Full Excel workbook
* Dashboard screenshot (see attachment)