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**College of Professional Studies**

**ITC6000 | 71713 | Module 4 HIV Dataset Overview North America**

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**Introduction**

This report undertakes a rigorous exploration of HIV incidence in North American countries, with a particular focus on Canada and the United States. The investigation is driven by specific research questions addressing the evolution of HIV cases, mortality rates, impact on children, prenatal testing, and the intricate correlation with socio-economic factors. The research methodology employed a meticulous extraction of data from reputable sources such as UNICEF, UN Data, the WORLD BANK, and UNAIDS. Analytical tools, including SQL for data manipulation and Excel for visualization, were complemented by statistical techniques for trend analysis.

HIV remains a global health challenge, necessitating continuous examination and analysis. This study homes in on the North American context, recognizing the unique dynamics of Canada and the United States. As the prevalence of HIV continues to impact diverse demographic groups, this research aims to unearth nuanced insights that can inform evidence-based policy recommendations for public health interventions.

**Data Collection and Methods**

The foundation of this study lies in the extraction of raw data from esteemed global databases. Rigorous data manipulation through SQL and insightful visualizations using Excel paved the way for a comprehensive exploration. Statistical techniques added depth to the analysis, allowing for a nuanced understanding of trends and patterns.

**Results**

**Results - HIV Data (Table 1):** The data table encapsulates critical HIV indicators, providing a snapshot of the prevalence, mortality, and demographic impact of HIV in North American countries from 2007 to 2016. Key Performance Indicators (KPIs), such as the HIV mortality rate and the proportion of new cases in children, were calculated to enrich the depth of analysis.

**Table 1**

**Results - Country Info (Table 2):** Essential country-level information, encompassing population size, GDP per capita, and unemployment rates, forms Table 2. These metrics serve as pivotal elements in unraveling the intricate correlation between HIV statistics and economic factors.

**Table 2**

**Data Integration and Analysis**

The integration of HIV-specific data with broader country-level information sets the stage for a holistic understanding. By considering population size, the analysis explores the multifaceted relationship between HIV statistics and economic indicators, ushering in a new dimension to the exploration.

**Table 3**

**Findings and Insights**

**Findings and Insights - Canada:**

Canada's HIV landscape reflects both successes and persistent challenges. Consistent numbers of children with HIV underscore the ongoing need for pediatric HIV management. A declining trend in the proportion of new cases in children indicates progress in prevention, while a steady increase in the percentage of women with HIV signals the necessity for targeted interventions. The declining HIV mortality rate and the gradual increase in total current HIV cases pose critical considerations for future public health strategies.

**Graph 1**

The mortality rate attributed to HIV exhibited a steady decline, decreasing from 70.49 in 2007 to 32.15 in 2016. This downward trend suggests notable advancements in the realms of treatment and healthcare. Concurrently, the total current HIV cases experienced a gradual increase, reaching 159,385.69 in 2016.

This rise underscores the persistent challenge posed by HIV prevalence, emphasizing the ongoing need for comprehensive interventions. Notably, the total number of deaths attributed to HIV decreased over the years, indicating improved healthcare outcomes and enhanced survival rates. On the other hand, new HIV cases displayed a fluctuating trend, prompting a call for further exploration into the contributing factors influencing this variability (Graph 1).

**Graph 2**

The number of children affected by HIV remains stable at 500, underscoring the continual requirement for effective pediatric HIV management. There has been a noteworthy reduction in the proportion of new cases in children, declining from 20.98% in 2007 to 12.94% in 2016. This decrease signifies significant progress in the prevention of pediatric HIV. The percentage of women with HIV has shown a gradual increase, rising from 23.6% in 2007 to 24.9% in 2016. This upward trend points to a need for targeted interventions aimed at women's health (Graph 2).

**Findings and Insights - USA:**

In the United States, the analysis reveals a consistent decline in the HIV mortality rate, indicative of advancements in healthcare. The gradual increase in total current HIV cases underlines the persistent challenge of prevalence, while the decrease in total deaths signifies improved healthcare outcomes. A fluctuating trend in new HIV cases warrants further exploration, and the consistently low proportion of new cases in children signifies successful prevention efforts.

**Graph 3**

The HIV mortality rate exhibited a consistent decline, dropping from 97.44 in 2007 to 46.62 in 2016, thereby highlighting advancements in healthcare and treatment. Conversely, the total current HIV cases experienced a gradual increase, reaching 159,385.69 in 2016, underscoring the persistent challenge posed by HIV prevalence. Over the years, the total number of deaths attributed to HIV decreased, indicating improved healthcare outcomes and enhanced survival rates. Meanwhile, new HIV cases demonstrated a fluctuating trend, prompting the need for further exploration into the contributing factors influencing this variability (Graph 3).

**Graph 4**

The percentage of new cases in children has consistently remained at a low level, signifying the effectiveness of prevention efforts in pediatric HIV. The percentage of women with HIV experienced a slight decrease from 24.4% in 2007 to 22.5% in 2016, indicating specific areas where focused interventions may be needed. The number of children with HIV remains constant at 500, emphasizing the continuous necessity for effective pediatric HIV management (Graph 4).

**Implications and Recommendations**

**Implications Supported by Data:**

1. **Economic Disparities**:

* The correlation between the HIV Mortality Rate and GDP suggests that economic disparities may significantly influence healthcare access and outcomes.
* Data Support: In Canada, a decrease in the HIV Mortality Rate corresponds with an increase in GDP (e.g., from 70.49 in 2007 to 32.15 in 2016).

2. **Pediatric HIV Management**:

* Consistent numbers of children with HIV indicate successful management, yet the slight increase in new cases signals ongoing challenges.
* Data Support: While the number of children with HIV remains steady at 500 in Canada, fluctuations in new cases warrant closer examination of contributing factors.

3. **Women-Specific Interventions**:

* The steady rise in the percentage of women with HIV underscores the necessity for targeted interventions in women's health.
* Data Support: In Canada, the percentage of women with HIV increased from 23.6% in 2007 to 24.9% in 2016.

**Recommendations Based on Data Insights:**

1. **Addressing Economic Disparities**:

* Interventions should prioritize improving healthcare access, particularly in economically disadvantaged regions.
* Data Support: Mortality rates decrease with an increase in GDP (e.g., Canada from 70.49 in 2007 to 32.15 in 2016).

2. **Focused Pediatric HIV Initiatives**:

* Targeted initiatives should aim at understanding and preventing pediatric cases, considering the consistent number of children with HIV and variations in new cases.
* Data Support: Children with HIV remain constant, while new HIV cases fluctuate in Canada.

3. **Women's Health Programs**:

* Develop and implement specific programs for women's health to address the rising percentage of women with HIV.
* Data Support: Canada witnessed an increase from 23.6% in 2007 to 24.9% in 2016.

These implications and recommendations, rooted in robust data analysis, provide a strategic framework for informed decision-making and interventions to enhance public health outcomes in Canada.

**Policy Recommendations:**

The policy recommendations derived from the comprehensive analysis underscore the urgency of addressing economic disparities to improve healthcare access. Focused initiatives for pediatric HIV management are recommended based on consistent numbers but fluctuating new cases. The proposal for specific programs targeting women's health is grounded in the steady rise in the percentage of women with HIV.

**Research Evaluations**

**Evolution of Total HIV Cases**

**Canada:**

* The total number of HIV cases in Canada exhibits a consistent upward trend from 2007 to 2016.
* The figures demonstrate a steady increase, reaching 8,368.292 in 2016, suggesting continuous but non-exponential growth in HIV cases over the specified period.

**United States:**

* Similarly, the United States observed a consistent rise in the total number of HIV cases from 127,709.34 in 2007 to 159,385.69 in 2016.
* This indicates a gradual increase in HIV incidence over the studied years.

**HIV Mortality Rate Trends**

**Canada:**

* The HIV mortality rate in Canada displays a declining trend, decreasing from 70.49 in 2007 to 32.15 in 2016.
* This signifies an improvement in survival rates and the effectiveness of managing HIV-related mortality.

**United States:**

Likewise, the HIV mortality rate in the United States witnessed a decrease, showcasing advancements in treatment and care, dropping from 97.44 in 2007 to 46.62 in 2016.

**Trends in Children Affected by HIV**

**Canada:**

* The number of children affected by HIV in Canada has generally decreased, reaching 269 in 2016.
* This downward trend indicates progress in preventing mother-to-child transmission.

**United States:**

The number of affected children also experienced a decline, reaching 7,430 in 2016.

**Changes in Percentage of Pregnant Women with Known HIV Status**

**Canada:**

* The percentage of pregnant women with a known HIV status in Canada has varied, starting at 23.6% in 2007 and decreasing to 24.9% in 2016.
* Fluctuations suggest variability in prenatal testing rates.

**United States:**

A similar pattern is observed, with a decrease from 24.4% in 2007 to 22.5% in 2016.

**Correlation of HIV Incidence with Socio-economic Factors**

* The United States and Canada both experience a noteworthy decrease in mother-to-child transmission rates during breastfeeding.
* In the United States, the rate dropped from 22.5% in 2007 to 7.76% in 2016, indicating successful interventions and positive healthcare advancements.
* Canada sees a substantial decline from 20.98% in 2007 to 12.94% in 2016, emphasizing successful interventions and positive outcomes in preventing HIV transmission during critical periods.

Key Insights:

**Key Learnings**

**Crucial Role of Population Size:**

Our analysis underscores the pivotal importance of considering population size when comprehending and tackling the challenges posed by HIV prevalence.

**Economic Indicators' Impact:**

The correlation observed between economic indicators, such as GDP, and the HIV Mortality Rate illuminates the interconnected nature of socio-economic factors and their influence on healthcare outcomes.

**Demographic Considerations:**

Demographic factors, particularly the proportion of Women with HIV, emphasize the necessity for tailored interventions aimed at addressing specific population groups.

**Challenges and Successes Unveiled:**

Our journey through this data exploration has revealed both challenges in interpreting fluctuating trends and successes in identifying key factors that significantly influence the dynamics of HIV.

**Integrated Approach's Significance:**

The integration of healthcare and economic data has provided a more holistic understanding, underscoring the vital importance of interdisciplinary collaboration in addressing complex health issues like HIV.

**Conclusion**

In summary, this comprehensive analysis provides valuable insights into the dynamics of HIV incidence in North American countries. The findings contribute to evidence-based policy recommendations for future interventions, emphasizing the importance of an integrated and interdisciplinary approach. As the global community continues to grapple with the complexities of HIV, this research seeks to inform strategies that promote public health resilience and inclusivity.

**References**

* Our World in Data. (2023). HIV/AIDS. [https://ourworldindata.org/hiv-aids](https://ourworldindata.org/hiv-aids)
* UNICEF. (2022.). Gender and HIV/AIDS. [https://data.unicef.org/topic/gender/gender-and-hiv-aids/]
* UNICEF. (2023.). Global and Regional Trends: HIV/AIDS. [https://data.unicef.org/topic/hivaids/global-regional-trends/]
* UNICEF. (2023.). HIV/AIDS Statistical Tables. [https://data.unicef.org/resources/dataset/hiv-aids-statistical-tables/](https://data.unicef.org/resources/dataset/hiv-aids-statistical-tables/)
* World Bank. (2023). World Development Indicators. [https://databank.worldbank.org/source/world-development-indicators](https://databank.worldbank.org/source/world-development-indicators)
* World Health Organization. (2023). Global Health Observatory (GHO) Data: HIV/AIDS. [https://apps.who.int/gho/data/view.main.22100?lang=en](https://apps.who.int/gho/data/view.main.22100?lang=en)
* World Health Organization. (2023). HIV Data and Statistics. [https://www.who.int/teams/global-hiv-hepatitis-and-stis-programmes/hiv/strategic-information/hiv-data-and-statistics](https://www.who.int/teams/global-hiv-hepatitis-and-stis-programmes/hiv/strategic-information/hiv-data-and-statistics)