

Projection and Visualization of Health Workforce Data in Indonesia Using Google Looker Studio (2015-2017)

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ABSTRACT

Study examines projection and visualization of health workforce data in Indonesia from 2015 to 2017 using Google Looker Studio. Analysis covers 10 professional categories, including nurses, midwives, pharmacists, and general practitioners, using secondary data from Kaggle. Objective is to evaluate workforce availability and support healthcare facilities in optimizing resource allocation and achieving organizational goals. Data was processed and visualized through an interactive dashboard in Google Looker Studio, presenting key insights such as regional distributions and workforce compositions. Findings indicate that Indonesia had 2,172 health workers during study period, with nurses and midwives contributing significantly, accounting for 638 and 830 workers, respectively. Google Looker Studio proved effective for visualizing health workforce data, enhancing planning and decision-making. Study highlights importance of data-driven approaches in addressing workforce challenges and supporting sustainable healthcare development in Indonesia..

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1. INTRODUCTION

Healthcare workforce planning plays a pivotal role in ensuring effective and efficient delivery of health services, particularly in a populous country like Indonesia. The increasing demand for equitable healthcare services highlights the need for precise projections and visualizations of workforce data. Accurate workforce planning and visualization allow stakeholders to identify disparities, forecast future needs, and allocate resources effectively [1].

The focus of this study is to project and visualize the number of health workers in Indonesia from 2015 to 2017, categorized into 10 professional roles, including nurses, midwives, pharmacists, dentists, and general practitioners. Utilizing Google Looker Studio, this research demonstrates how advanced data visualization tools can provide actionable insights for healthcare planning and management. Google Looker Studio has been widely recognized for its ability to create interactive dashboards, offering real-time updates and enhancing data accessibility [2].

Previous studies have shown that interactive dashboards contribute significantly to improving decision-making processes in various sectors, including healthcare [3], [4]. By presenting data through visual elements such as charts, graphs, and tables, users can interpret complex datasets more effectively. The integration of Google Looker Studio with secondary data analysis enables detailed exploration of workforce distributions, identifying critical areas for improvement in healthcare resource allocation [5].

This study adopts a secondary data analysis approach, utilizing data sourced from Kaggle, which includes workforce projections from 2015 to 2017. Secondary data analysis offers a cost-effective and efficient method for leveraging existing data to gain valuable insights [6]. The data is visualized to highlight trends, regional distributions, and professional compositions, providing a clear overview of workforce availability across Indonesia. Research in similar domains has emphasized the importance of leveraging secondary data to address systemic challenges in healthcare delivery [7].

The findings of this research are expected to support long-term healthcare workforce planning, ensuring that resources are allocated based on accurate projections and regional needs. By integrating advanced data visualization tools like Google Looker Studio, this study contributes to the broader objective of achieving equitable and sustainable healthcare development in Indonesia. As noted in prior studies, the integration of technology into healthcare planning processes enhances accuracy, efficiency, and stakeholder engagement [8], [9].

In conclusion, this study highlights the potential of data visualization in transforming complex healthcare workforce data into actionable insights. The results demonstrate how tools like Google Looker Studio can be applied to address critical challenges in healthcare planning and management, ultimately supporting policymakers in achieving national healthcare goals [10], [11].

2. METHOD

This research uses a dataset method obtained from the website www.kaggle.com, formatted as CSV data, and applies Secondary Data Analysis to process the information using Google's Looker Studio. The processed data is then visualized to support decision-making processes based on the insights provided by the visualization results [13].

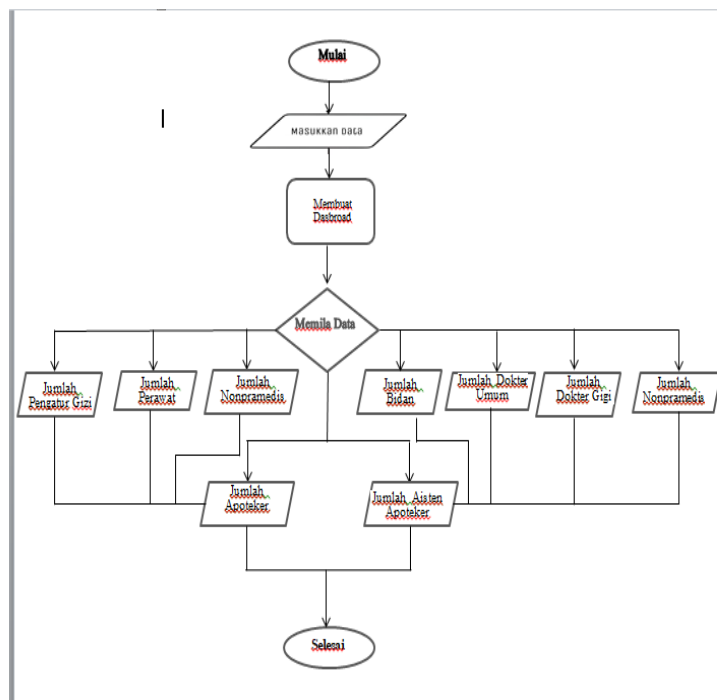


Figure 1. Research Flow Diagram

Figure 1 shows the research steps which begin with entering data into Google Looker Studio. After that, create a dashboard design, then, sort the data using secondary data management methods and separate the data according to element profession

The type of research conducted is observational, encompassing 34 provinces and 471 districts/cities across Indonesia. Facilities and personnel data for each district/city were collected to evaluate availability in 2014. Secondary data collection was carried out in 2015, utilizing various sources such as the Ministry of Health of the Republic of Indonesia. These datasets included information on the number of health centers, hospitals, specialist doctors, and hospital beds (TT) in 2014 [14]. Misnaniarti et al. (2018) emphasized the importance of such comprehensive datasets for analyzing healthcare resource distribution and planning [15]

3. RESULTS AND DISCUSSION

This section discusses the implementation process *Secondary Data Analysis* in Google Looker Studio to facilitate data processing. Projection of the number of Indonesian health workers based on profession elements 2015-2017. Results and extraction process *datasource* and processing it, so that it can be obtained later *output* element and year

3.1 Data Preparation Stage

Datasource used in this research is the projection of the number of Indonesian health workers based on the 2015-2017 elements. The data is in CSV format obtained from www.kaggle.com. With data period 2015-2017. The data consists of 5 *Columns* and 397 *Rows*.

1.2 Data Execution Stage

In this section is the process where researchers process data sources inward *platform lookerstudio google*. The following is the explanation:

1. First *import* data originating from www.kaggle.com and the process of reading the data in the form of a projection of the number of health workers based on the 2015-2017.csv element. (Handayani et al., 2018)
2. The next process is connecting data to *platform Lookerstudio google*, with *import* data source into *Lookerstudio google*.

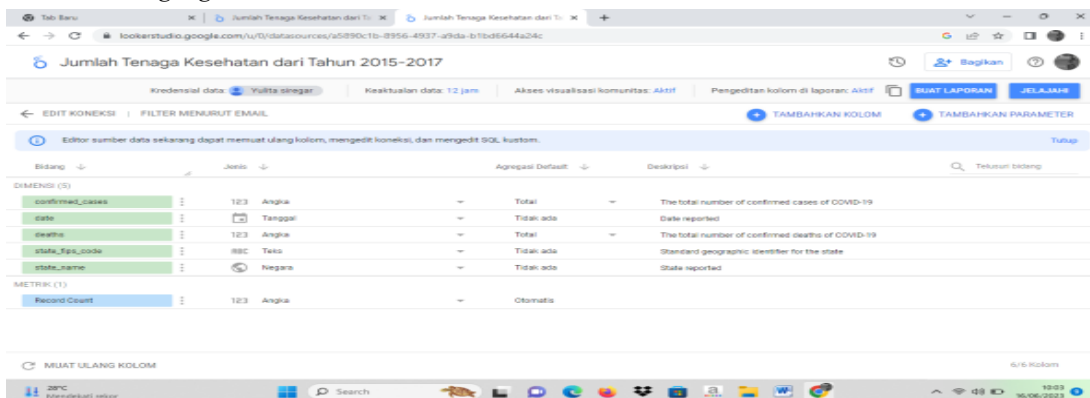


Figure 2. Studio looker display

In figure 2, it is *datasource* Projections of the number of Indonesian health workers based on elements for 2015-2017 in CSV format have been linked to *Lookerstudio google*. On *datasource* there are several of them *field* data displayed such as, number, profession, element, year.

3. After that, researchers continued to the processing stage and analyzed the data on the number of Indonesian health workers reported.

3.2 final result

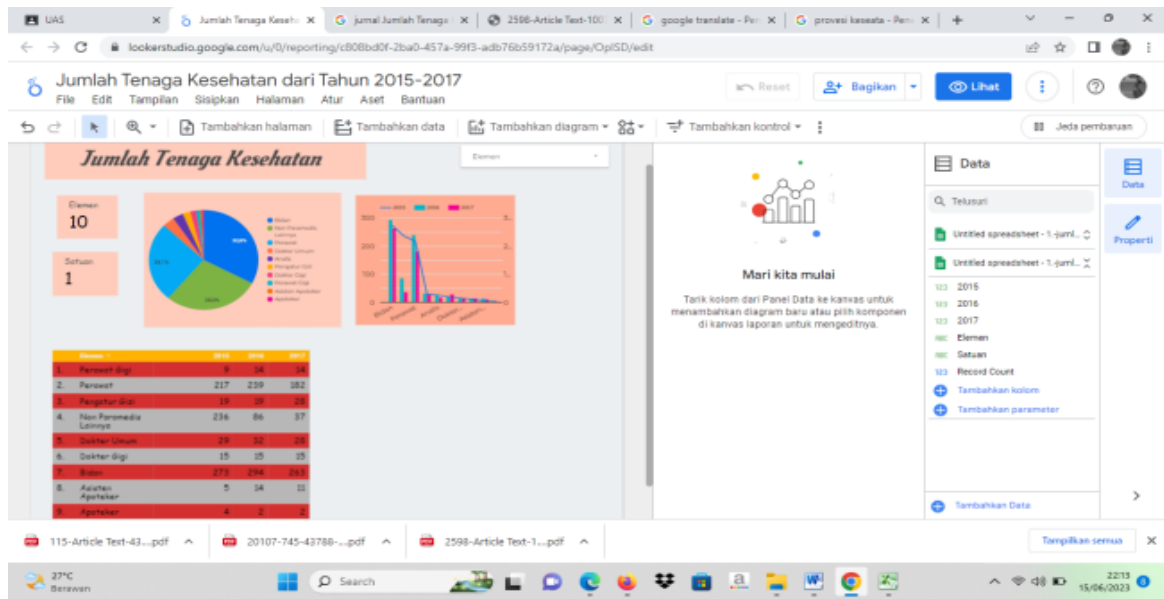


Figure 3. Final Dashboard View

After going through the data execution stages, the researcher then created a visualization to produce information from the Total Projection data Ke's PowerIndonesian hatan based on elements 2015-2017. The data obtained is the number of professional health workers who are pharmacists, pharmacist assistants, and other non-paramedics.

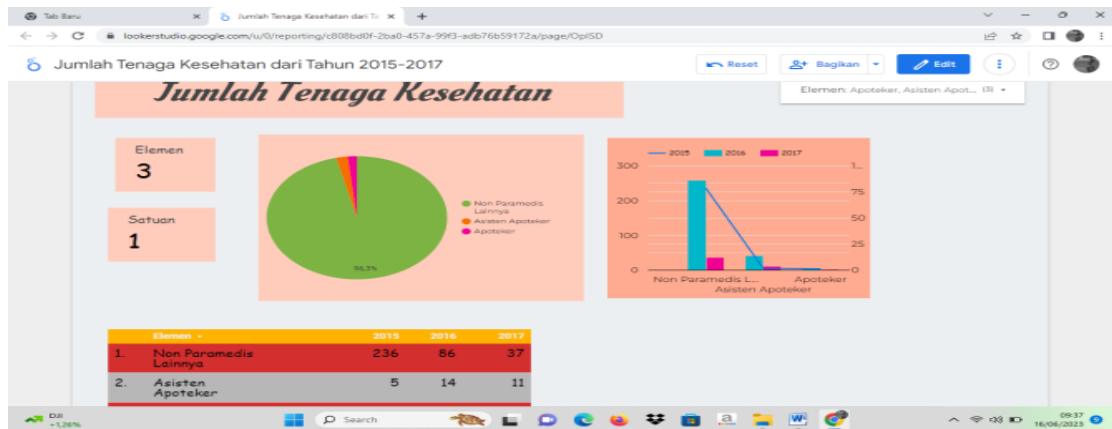


Figure 4. Number of Profession of pharmacists, pharmacist assistants, other non-paramedics And got it Number of Personnel Kehatan Profession Dental Nurse Nurse, Nutritionist

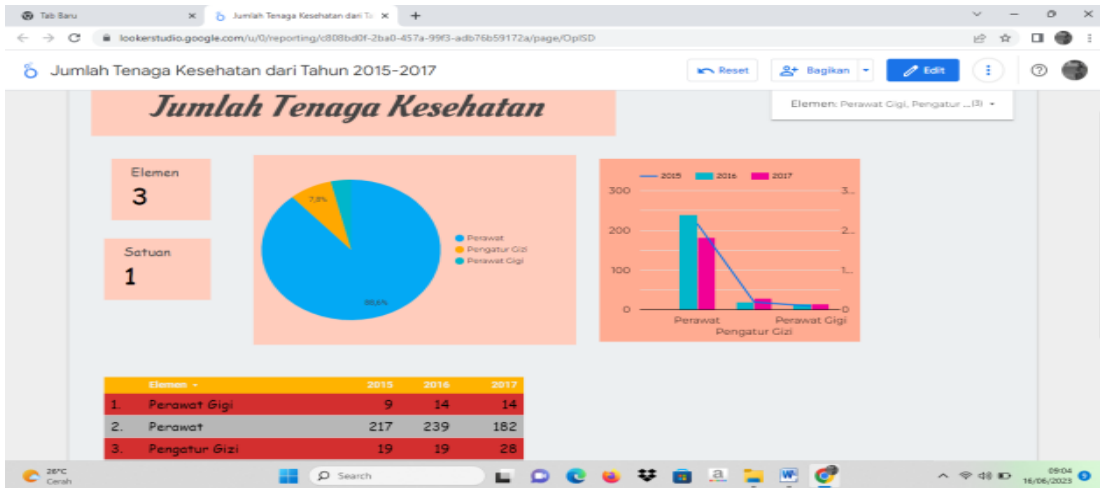


Figure 4. Number of KEshtan Profession Dental Nurse Nurse, Nutritionist

And also got it Number of Personnel KeProfession: Midwife, Dentist, General Practitioner, Analysis

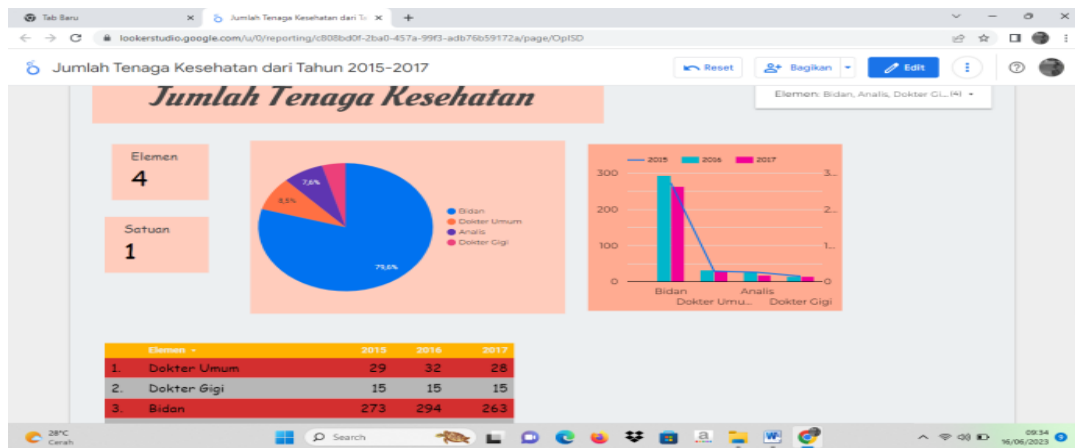


Figure 5. Number of Profession: Midwife, Dentist, General Practitioner, Analysis

In the final section we can determine the amount of data obtained, namely the total amount Ke's PowerIndonesian forest in 2015-2017



Figure 6. The total number

CONCLUSION

Projection of health workforce data in Indonesia for 2015–2017 using Google Looker Studio demonstrates effectiveness in visualizing complex datasets. Research analyzed ten professional categories, including nurses, midwives, and general practitioners, revealing a total workforce of 2,172 health workers during the studied period. Interactive dashboards created using Google Looker Studio facilitated intuitive understanding of workforce distributions and trends across regions. Findings highlight utility of secondary data analysis and visualization tools in supporting data-driven decision-making for healthcare planning. By providing detailed projections and visual insights, research contributes to addressing disparities and planning for future healthcare workforce needs. Study underscores importance of leveraging advanced visualization platforms to enhance resource allocation and efficiency in healthcare management, aligning with national goals of equitable and sustainable health service delivery. Continued focus on accurate data and technology integration remains critical for long-term success.

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BIOGRAPHIES OF AUTHORS (10 PT)

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