

## Access to Public Available Health Data and Knowledge of Health Indicators Among Students at the Faculty of Public Health in Timor-Leste

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### Abstract

Increasing the capacity to provide quality, timely and reliable data is one of the targets of the SDGs, especially in small island states like Timor-Leste. This research aims to analyze Faculty of Public Health students' access to public health data and their understanding of key health indicators. This research used a quantitative method with a cross-sectional survey approach with a structured questionnaire that was self-completed by the respondents. The sample consisted of 152 purposively selected students from the first to fourth semester. Data were analyzed using descriptive statistics. The results showed that most students had accessed various sources of health data, such as the Timor-Leste Ministry of Health (91%), WHO (78%), and UNICEF (63%). However, students' understanding of important health indicators was low; 86% did not understand the underweight indicator, 80% did not understand life expectancy, and 90% did not understand infant mortality. This research implies the need for curriculum development that focuses on data literacy and statistics to improve students' ability to access, analyze, and understand public health data. This intervention is important to prepare graduates who are able to face future data-driven public health challenges.

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**Keywords:** Data Access, Statistical Literacy, Health Indicators, Timor-Leste, Public Health.

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## INTRODUCTION

In this era of globalization, information from various parts of the world can be obtained quickly. This information can be presented in various forms, such as distribution tables, graphs, curves, and diagrams (Hidayati & Waluya, 2020). The presentation of the data is intended to make the data more accessible for readers to understand and interpret. However, the fact is that some college students have not been able to translate the data or information presented in tables or graphs. A person's ability to interpret data is a statistical literacy ability, as much data is available publicly online (Belawati, 2019). Therefore, firstly, students need to be equipped with IT literacy to access necessary data. Literacy includes basic and essential skills that can be used in understanding statistical information or research results. These skills include organizing data, creating and displaying tables, and working with different data representations (Hafiyusholeh, 2015). In addition, IT

literacy to access public data also needs to be capable of interpreting it. Sometimes, online data can be managed and analyzed in the dashboard (Wolff et al., 2016).

The ability to understand and critically evaluate statistical results that permeate our daily lives coupled with the ability to appreciate the contributions that statistical thinking can make in public and private, professional and personal decisions (Weiland, 2017). Statistical literacy is the ability of a person to formulate, apply, and interpret mathematics in various contexts, including the ability to make statistical reasoning and use concepts, procedures, and facts to describe, explain, or predict an event (Saputri et al., 2019). More broadly, statistical literacy can be understood as an individual's capacity to recognize and understand the role of statistics in academic life, appropriately give an assessment, and utilize statistical knowledge in academics (Khaerunnisa & Pamungkas, 2017). In that case, students must know how to collect facts, process and analyze them, draw conclusions, and present and publish data in numbers. Because statistics is a science that studies how to plan, collect, analyze, interpret, and present data.

Based on the observation about IT literacy and statistics in public health, students still lack understanding to use statistics such as Excel, SPSS, epiinfo, R (Project R for statistical computing and other software, specifically, below: Summary, average, simple table, cross table, pie chart, chi-squared test, bar chart, and t-test. In other parts of the world, many students don't have access to data from UNICEF data, Work Bank data, WHO data, the Demography Health Survey, and the National Census in Timor Leste. Many students didn't know the underweight, SBAs, measles immunization, life expectancy, maternity mortality ratio, and infant mortality rate in the Ministry of Health. That is, students need to access online data from the Internet because now, many data are updated online, such as WHO data, Work Bank data, UNICEF data, and other links, to increase the knowledge of students in public health.

Several studies have shown the importance of statistical literacy in higher education. According to research by (Masjudin et al., 2020), data interpretation skills among students are still low, especially related to understanding and analyzing basic statistics. Another research by (Fallon, 2024) found that statistical literacy has a significant impact on students' ability to read and analyze research results in the health sector. In addition, research conducted by (Mandinach et al., 2011) highlighted the importance of statistical literacy training and the use of data analysis software to support students in making data-driven decisions in their academic and professional environments.

Based on the aforementioned issues, this research sought to explore the level of IT literacy and statistical knowledge among students at the Faculty of Public Health, Universidade da Paz, Timor Leste, in 2022. The research aimed to assess students' proficiency in accessing, processing, analyzing and interpreting public health data, with a focus on bridging the identified gaps in statistical and IT literacy. The benefit of this research is to provide greater insight into the IT and statistical literacy levels of university students in public health. With this understanding, it is expected to contribute to curriculum development that is more responsive to the needs of data and IT literacy, so as to improve students' skills in accessing, processing, and analyzing health data.

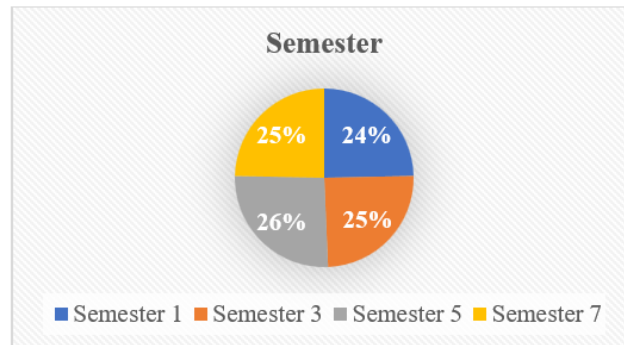
## **RESEARCH METHOD**

This research used a quantitative research approach with a cross-sectional survey design. The target population included students from all semesters at the Faculty of Public Health at Universidade da Paz (UNPAZ), Timor-Leste. A purposive sampling technique was applied to select participants based on their enrollment status, resulting in 152 valid responses. Data were collected using a self-administered structured questionnaire

consisting of four sections: respondent characteristics, IT usage, statistical skills, and access to publicly available health information and knowledge of health indicators in Timor-Leste. The questionnaire was distributed in person during lectures in six classes from May 3 to 5, 2022. Responses were collected anonymously and entered twice into Epi-Info software to ensure accuracy. Data analysis included descriptive statistics to summarize the characteristics and patterns of IT use and data access, as well as statistical knowledge among the students.

## RESULT AND DISCUSSION

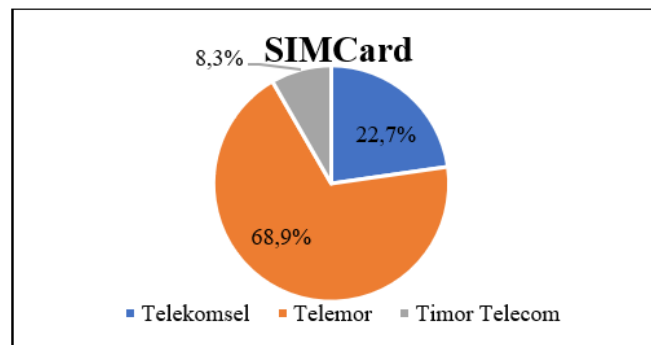
### Semester



**Figure 1. Semester**

Based on the results of a survey conducted by the Faculty of Public Health show that 24% from semester one, 25% from semester three, 26% from semester five, and 25% from semester seven.

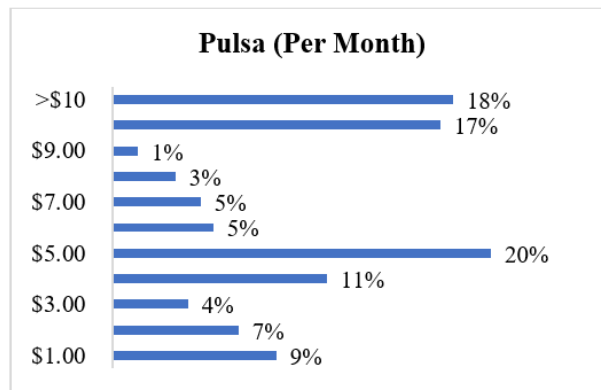
### Municipality



**Graphic 2. SIM Card**

The results of a survey conducted at the Faculty of Public Health show that 68.9% of students used Telemor SIMCard, 22.7% of students used Telekomsel SIMCard, and 8% of students used Timor Telecom SIMCard.

### Pulsa used to access the Internet

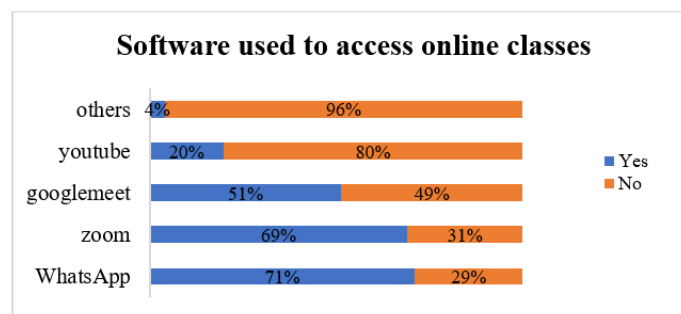


**Figure 3. Pulsa (Per Month)**

Based on the results of a survey conducted at the Faculty of Public Health shows that 20% of students used pulsa \$ 5.00 per month, 18% of students used pulsa >\$ 10.00 per month, 17% of students used pulsa \$ 10.00 per month, 11% of students used pulsa \$ 4.00 per month, 9% of students used pulsa \$ 1.00 per month, 7% of students used pulsa \$ 2.00 per month, 5% of students used pulsa \$ 7.00 & \$6.00 per month, 4% of students used pulsa \$ 3.00 per month, and 1% of students used pulsa \$ 9.00 per month.

### Results

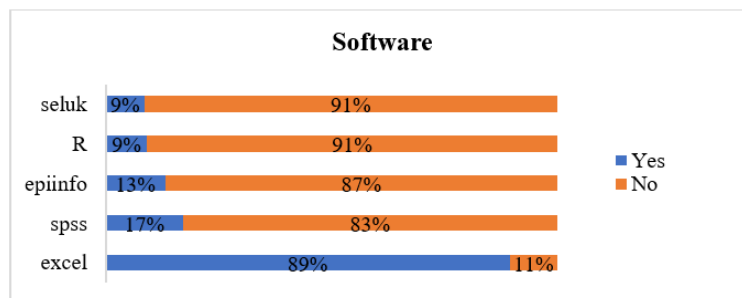
#### IT used



**Graphic 4. Software used to access online classes**

The results of a survey conducted at the Faculty of Public Health show that 71% of students use WhatsApp to access online classes, 69% of students use Zoom Meeting, 51% of students use Google Meet, 20% of students use YouTube, and 4% use other software. The results show that many students of public health use WhatsApp to access online classes compared with other software.

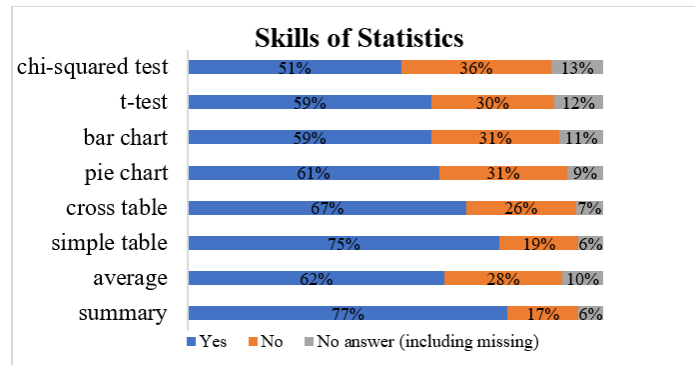
#### Statistics skills



**Figure 5. Software**

The results of a survey conducted at the Faculty of Public Health show that 89% of students used Excel, 17% of students used SPSS, 13% of students used epi info, and 9% of students used R (the R project for statistical computing) and other software. Thus, many public health students use Excel to calculate and analyze data in public health.

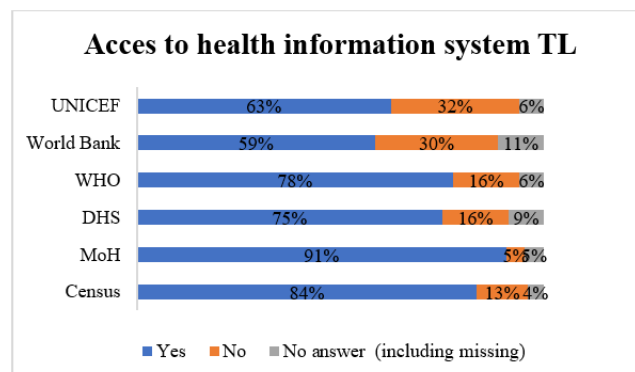
### Self-reported statistics skills



**Figure 6. Skills of Statistics**

The results of a survey conducted at the Faculty of Public Health show that 77% of students used the function Sum, 62% of students used the function Average, 75% of students used a simple table, 67% of students used a cross table, 61% of students used a pie chart, 51% of students used a chi-squared test, and 59% of students used a bar chart and t-test. The results show that many students of public health used the function Summary.

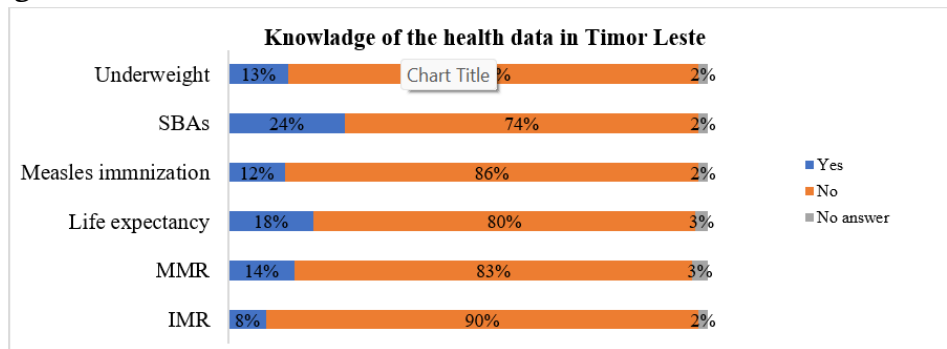
### Students Access the Health Information System



**Figure 7. Access to health information system TL**

Based on the results of a survey conducted at the Faculty of Public Health show that 63% of students access UNICEF data, 62% of students access Work bank data, 78% of students access WHO data, 75% of students access Demography Health Survey (DHS), 91% of students access to data from Minister of Health Timor-Leste, 84% of students access to national Census in Timor Leste. The results show that many public health students have access to data from the minister of health in Timor Leste.

## Knowledge Students of the Health Indicator in Timor Leste



**Figure 8. Knowledge of the health data in Timor Leste**

Based on the results of a survey conducted by the faculty of Public Health show that 13% of students understand the underweight, 86% of students do not understand the underweight, 24% of students understand the SBAs and 74% of students do not understand the SBAs, 12% of students understand the measles immunization and 86% of students do not understand the measles immunization, 18% of students understand the life expectancy and 80% of students do not understand the Life expectancy, 14% of students understand the maternal mortality ratio and 83% of students do not understand the maternity mortality ratio, 8% of students understand the infant mortality rate and 90% of students do not understand the infant mortality rate.

### Discussion

#### IT used

The results of a survey conducted by the Faculty of Public Health show that 71% of students use WhatsApp for online classes, 69% use Zoom meetings, 51% use Google Meet, 20% use YouTube, and 4% use other software. The results show that many public health students use WhatsApp to access online classes compared with other software.

This online learning process has been pursued by East Timorese educational institutions that provide online learning platforms such as video conferences, Google Meets, WhatsApp groups, and Zoom meetings, which can be used as online learning media. The application that is widely used by students at the Faculty of Public Health UNPAZ is WhatsApp compared to other applications because the dissemination of any information and communication is also carried out through WhatsApp, starting from learning and discussions with assignments given by lecturers to students. This WhatsApp application can make it easier for students to consult with lecturers and other students around the campus environment and outside the campus.

The results above compared with the research from (Rahartri, 2019) on the total use of communication media during the period of 2016-2018 is as follows: the use of WhatsApp is 63.35%, While the use of other communication media (email, telephone, direct) as much as 36.65%. The results of interviews with some of the leaders show that the users like to use WhatsApp as a form of communication media because WhatsApp is simple and does not require a password; WhatsApp is directly connected to the number stored in the mobile contact; WhatsApp is a practical and timely SMS replacement for sending messages.

#### Statistics skills

The results of a survey conducted at the Faculty of Public Health show that 89% of students used Excel, 17% of students used SPSS, 13% of students used epi info, and 9% of

students used R (the R project for statistical computing) and other software. Thus, many public health students use Excel to calculate and analyze data in public health.

Managing quantitative data is one of the abilities that every final semester student must possess to process research data in the form of theses, dissertations and other research (Ramadhan, 2021). This ability is correlated with understanding basic statistics and research methodology capabilities. This is due to the weak ability to manage data; every student who takes an S1 education must master fundamental statistical skills. In addition, the MS Excel program has multiple functions, especially for data in the form of numbers (quantitative). It will be very easy for someone to store, process and analyze data in the form of numbers in the form of research data, company data, school data, government agency data and so on (Nadirah et al., 2022).

The Faculty of Public Health students must have skills in data analysis software such as Excel, SPSS, Epiinfo, R, etc. However, based on the results of this research, it is shown that many students use Microsoft Excel for data analysis, followed by SPSS. Because students are more familiar with the application in public health facilities. According to Fauziyah, software is a computer program that is useful for inputting data, storing data, checking data, manipulating data, analyzing data and obtaining results from the data.

Research from Hayun & Izzah (2018) showed that there was a significant difference in the comprehension ability category obtained by the experimental class, with a high category of 68.18% and a medium category of 31.82%, while for the SPSS class, a high category of 25% and a medium category of 75%. Thus, the treatment of the Ms. Excel class was better than that of the SPSS class.

### **Self-reported statistics skills**

Statistics is a set of ways and rules related to the collection, processing (analysis), and drawing of conclusions on data in the form of numbers using a certain assumption. Statistics are vital in man's daily activities (Johnson & Bhattacharyya, 2019). Applied statistics (application) are statistics that only research techniques of their use and do not require strong math ability (Chatfield, 2018). Applied statistics only use formulas or rules found in theoretical statistics to solve a problem.

The results of a survey conducted at the Faculty of Public Health show that 77% of students used the function Sum, 62% of students used the function Average, 75% of students used a simple table, 67% of students used a cross table, 61% of students used a pie chart, 51% of students used a chi-squared test, and 59% of students used a bar chart and t-test. The results show that many students of public health used the function Summary.

Students with statistical data analysis skills are more likely to observe abilities that are essential for the student's life. A person's ability to succeed in life is, among others, determined by his thinking skills, especially to solve his life problems.

### **Experience in access to available publicly**

Based on the results of a survey conducted at the Faculty of Public Health show that 63% of students access UNICEF data, 62% of students access Work bank data, 78% of students access WHO data, 75% of students access Demography Health Survey (DHS), 91% of students access to data from Minister of Health Timor Leste, 84% of students access to national Census in Timor Leste. The results show that many public health students have access to data from the minister of health in Timor Leste.

The development of information systems in the health sector is progressing rapidly, and the need for data management in all health organizations is increasing. Graduates of the Health Management Information Systems program will answer the need for health data and information for decision-making. Students will learn the role of health information systems for strategic and operational purposes, research, and strategies needed to improve health degrees.

According to research from (Nurjanah et al., 2016) conducted on 2nd-semester students of the S1 Public Health research program at Dian Nuswantoro University Semarang, 40.2% of respondents with low levels of health literacy were obtained, and 95.9% of respondents were unable to answer the question of nutritional facts in measurement correctly.

As a student of the faculty of public health, I must understand health literacy, which teaches me how to access, understand, assess, and apply information to make decisions in terms of health, disease prevention, and health promotion. So, students should know how to extract data from MoH, WHO data, Unicef data, Demography Health Survey (DHS), Census, and work bank data because of the accurate information from these sources. Most students of the Faculty of Public Health have access to data from the Ministry of Health of East Timor compared to other sources.

### **Knowledge students of the health indicators in Timor Leste**

The results of a survey conducted at the Faculty of Public Health show that 86% of students don't understand underweight, 74% of students access don't understand SBAs, 86% of students don't understand measles immunization, 80% of students don't understand Life expectancy, 83% of students don't understand the maternity mortality ratio, and 90% of students don't understand the infant mortality rate.

Based on research by (Syecha, 2016), who assessed health literacy in students in the first semester of the Faculty of Health, Dian Nuswantoro University Semarang in 2014, 31.9% of respondents had a low level of health literacy. Respondents with good health literacy tend to be more active in using health services such as doctors and ask more questions during consultations with doctors.

Modern technology is increasingly developing, and information systems can be accessed easily. An example is a change in the information system that may still be offline, or paper is needed to contact the relevant party to get information. However, it can now be accessed online via a smartphone or computer (Fauzi et al., 2023). However, students still lack an understanding of Health indicators such as Maternal mortality ratio, infant mortality rate, Life expectancy, measles immunization, SBAs, and underweight. The neglecting factor is that students are not looking for important information related to health (Mujeri et al., 2020).

## **CONCLUSION**

This research reveals significant insights into the IT literacy and statistical skills of public health students at Universidade da Paz, Timor-Leste. While most students reported accessing publicly available health data from sources such as the Ministry of Health and global organizations like WHO and UNICEF, their knowledge of key health indicators, including maternal mortality rate, infant mortality rate, life expectancy, measles immunization, and underweight prevalence, remains limited. Furthermore, students primarily rely on basic data analysis tools, such as Microsoft Excel, with minimal



utilization of advanced statistical software like SPSS or R. This gap underscores a disconnect between the ability to access health data and the capacity to interpret critical public health indicators effectively.

The findings emphasize the need for targeted interventions to enhance both IT and statistical literacy among public health students. These could include integrating advanced statistical training into the curriculum, providing workshops on interpreting health indicators, and fostering familiarity with diverse global health data sources. Future research should explore the development of tailored educational programs that combine data access with advanced analytical skills, focusing on improving the ability to derive actionable insights from public health data. This contribution will be vital in preparing students to address public health challenges effectively and meet the data-driven demands of the health sector in Timor-Leste and beyond.

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