

DENGUE FEVER CASE PREDICTION MODEL USING LINEAR REGRESSION WITH EXPLANATORY SEQUENTIAL MIXED METHODS APPROACH

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Abstract

Dengue Hemorrhagic Fever (DHF) is an infectious disease in Indonesia, including in Sikka Regency, where the number of cases has increased over the past decade. Predicting the number of DHF cases is crucial to support disease prevention and control policies. This study aims to develop a predictive model for the number of dengue fever cases based on building area, population, and population density, moreover to explain other factors that influence the prediction results. The study uses an explanatory sequential mixed methods approach, and the prediction model is developed using simple linear regression and multiple linear regression. Quantitative data were obtained from the Health Office, the Sikka Regency Statistics Office, and Google Earth; while qualitative data were obtained through interviews with surveillance personnel from the Health Office and several community health centers in the study area, using a purposive sampling technique. The results show that the building area has a weak relationship with the number of DHF cases ($R^2 = 0.10334$ for Alok Timur sub-district and $R^2=0.38055$ for Waiblama). After adding the population and population density variables, the R^2 in Alok Timur increases to 0.46974; and $R^2=0.41024$ for Waiblama; however, the accuracy is still low. The interviews results show that community behavior is the dominant factors of DHF cases. This study indicates that predictive models based on physical environmental and population variables are unable to accurately depict the complexity of dengue fever case distribution. Therefore, the development of models that integrate community behavioral factors is necessary to provide more accurate predictions.

Keywords: Prediction, DHF, Building Area, Total Popoulation, Linear Regression

Abstrak

Demam Berdarah Dengue (DBD) merupakan salah satu penyakit menular yang menjadi masalah kesehatan masyarakat di Indonesia, termasuk di kabupaten Sikka-NTT yang cenderung meningkat dalam 10 tahun terakhir. Upaya memprediksi jumlah kasus DBD penting untuk mendukung kebijakan pencegahan dan pengendalian penyakit. Penelitian ini bertujuan untuk membangun model prediksi jumlah kasus DBD berdasarkan luas bangunan, jumlah penduduk, dan kepadatan penduduk, serta menjelaskan faktor lain yang berpengaruh terhadap hasil prediksi. Penelitian menggunakan pendekatan Explanatory Sequential Mixed Methods yang mengintegrasikan analisis kuantitatif dan kualitatif. Model prediksi dibangun secara bertahap menggunakan regresi linear sederhana dan regresi linear berganda. Data kuantitatif diperoleh dari Dinas Kesehatan, BPS kabupaten Sikka, dan Google Earth; sedangkan data kualitatif diperoleh melalui wawancara dengan surveilans dari Dinas Kesehatan dan beberapa puskesmas pada wilayah penelitian, dengan teknik purposive sampling. Hasil analisis menunjukkan bahwa luas bangunan memiliki hubungan yang lemah terhadap jumlah kasus DBD (nilai $R^2=0,10334$ untuk kecamatan Alok Timur dan $R^2=0,38055$ untuk kecamatan Waiblama). Setelah penambahan variabel jumlah penduduk dan kepadatan penduduk, nilai R^2 pada kecamatan Alok Timur meningkat menjadi 0,46974; dan $R^2=0,41024$ untuk kecamatan Waiblama; namun akurasi model masih tergolong rendah. Berdasarkan hasil wawancara, diketahui bahwa perilaku masyarakat, seperti kebiasaan menjaga kebersihan lingkungan dan kepatuhan terhadap program Pemberantasan Sarang Nyamuk, merupakan faktor dominan yang memengaruhi jumlah kasus DBD. Dapat disimpulkan bahwa model prediksi berbasis variabel lingkungan fisik dan kependudukan belum mampu menggambarkan kompleksitas penyebaran kasus DBD secara akurat. Oleh karena itu, diperlukan pengembangan model yang mengintegrasikan faktor perilaku masyarakat agar hasil prediksi lebih akurat untuk mendukung kebijakan pemerintah daerah terkait kasus DBD.

Kata kunci: Prediksi; DBD; Luas Area Bangunan; Jumlah Penduduk; Regresi Linear

INTRODUCTION

Dengue fever is an infectious disease that is a public health problem in tropical and subtropical climates (Chen & Moraga, 2025), including Indonesia (Mamenun et al., 2024; Ramadhani & Latif, 2021). Large cases of dengue fever occur in urban and semi-urban areas, especially during the rainy season, where environmental conditions support the breeding of *Aedes Aegypti* and *Aedes Albopictus* mosquitoes as intermediaries (vectors) (Kolimenakis et al., 2021; Puspita et al., 2023). DHF can cause death if not treated seriously (Ismail et al., 2024; Medagama, Dalugama, Meiyalakan, & Lakmali, 2020) and there is no effective warning system (Leung et al., 2023). World Health Organization (WHO) recorded the highest number of dengue cases in 2024, affecting more than 100 countries. More than 14.6 million cases and 12,000 deaths have been reported related to dengue fever. In fact, from January to July 2025, more than 4 million cases and 3,000 deaths have been reported to WHO from 97 countries, and it has spread to new regions including Europe and the Eastern Mediterranean (Organization, 2025). There is no specific treatment that significantly reduces the death rate from dengue fever (Tian et al., 2024), because often DHF does not show symptoms or only shows mild symptoms (Organization, 2025), and therefore the prevention and control of dengue fever depends on vector control (Koplewitz, Lu, Clemente, Buckee, & Santillana, 2022).

Sikka Regency, East Nusa Tenggara is one of the endemic areas for dengue fever and has been designated as an Extraordinary Event 5 times, which recurs every 3-4 years. From 2010 to 2019, there were 2,251 cases. The highest number of cases occurred in 2020 with 1,816 cases, with the largest age group being between 5 and 15 years old. In 2021, there were 183 cases, in 2022 with 466 cases, in 2023 with 822 cases, and in 2024 with 821 cases, and in early 2025, 50 cases were recorded, with 33 cases among children aged 5-15 years. Most cases occur in densely populated areas and urban areas (Adang, Marni, & Limbu, 2024; da Cunha, Samin, & Rahmawati, 2022; De Rosary, 2024; Pareira, Parera, & Hildegardis, 2023; Popi, 2025). According to data from the Sikka Regency Health Office, Alok Timur sub-district has the highest number of dengue fever cases, while Waiblama sub-district has the lowest number of cases. Therefore, these two locations were chosen for comparison in this study.

Based on data and previous research results in Sikka district, there is a significant relationship between the presence of mosquito

larvae and dengue fever cases (Adang et al., 2024). The existence of larvae is influenced by environmental conditions (da Cunha et al., 2022; De Rosary, 2024; Popi, 2025), including the presence of buildings, which is associated with the number of mosquito breeding spots. Therefore, analyzing the relationship between building area and the number of dengue cases is important to understand the spread pattern of this disease and can develop more effective prevention strategies. Moreover, demographic factors such as population size and population density are also considered to have the potential to influence the number of dengue fever cases, because theoretically, areas with higher population size and density have a greater potential for disease transmission due to more intense interactions between individuals and limited living space.

This study aims to build and test the accuracy level of the prediction model for the number of dengue fever cases based on the building area, population and population density, using the linear regression method, which is a statistical method that can be used to determine the relationship between predictor variables (building area, population and population density) and response variables (number of dengue fever cases) (Roustaei, 2024). Linear regression is used because it is effective in analyzing the relationship between a dependent variable and one or more independent variables that are numerical in nature, in a simple and easy-to-interpret manner. In this case, all predictor variables (dependent variables) are numerical data, which theoretically relate to an increased risk of dengue fever (independent variables). This method is also effective for small data sizes, and can identify the variables that contribute most to variations in DHF cases. (Hope, 2020). In addition, residual analysis helps evaluate the accuracy of the model and reveals other factors that may influence the incidence of dengue fever (Kleden, Atti, & Sinu, 2025).

Comprehension of the correlation between the area of buildings, the number of residents and population density in an area with the number of DHF cases, the government through the Health Service and the Regional Development Planning, Research and Innovation Agency (BAPPERIDA), can use the available prediction models to map areas that are at high risk of increasing DHF cases. With the specific information, government can include more specific and optimal prevention programs and resource allocation such as DHF-related campaigns, medical personnel, medicines, and fogging equipment to locations that are predicted to

experience an increase in HDF cases. Additionally, the specific information is the basis for policy making related to spatial planning and development regulations.

RESEARCH METHODS

Types of research

This research uses the Explanatory Sequential Mixed Methods approach, namely a mixed research design that is carried out sequentially, starting with quantitative research, followed by qualitative research to explain the results of quantitative research (Draucker, Rawl, Vode, & Carter-Harris, 2020). The research focuses more on secondary data analysis to build a prediction model for the number of DHF cases based on physical environmental variables (building area) and population (total and density of population), nonetheless is supplemented by the results of interviews and observations related to supporting factors for DHF, such as community behavior, to support the conclusions. The research stages can be seen in Figure 1.

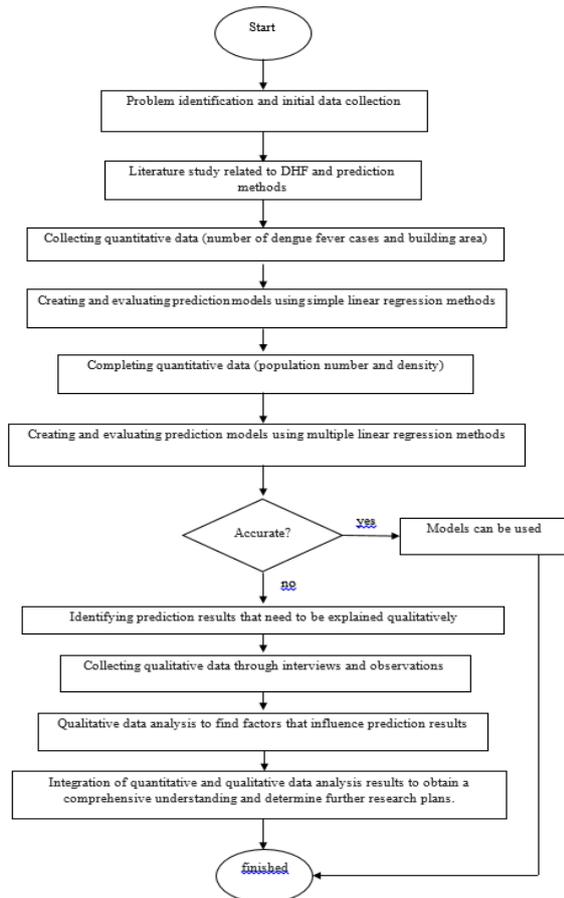


Figure 1. Research Flowchart

Time and Place of Research

This research was conducted in two areas in Sikka Regency: Alok Timur and Waiblama sub-districts. The study began with secondary data collection on the number of dengue fever cases through the Health Office and several community health centers in Sikka Regency. This was followed by site observations and interviews with health workers specializing in dengue fever surveillance at the Health Office and several community health centers from early July to August 2025. Data collection related to building area was also achieved using the Google Earth application from the end of July to the beginning of September 2025. Data processing, construction of a simple linear regression model using building area variables, model evaluation and analysis of the results were completed during September 2025. Secondary data collection was achieved in the form of population and population density data from the Central Statistics Agency in October 2025, followed by data processing, building models, evaluation and analysis of the results until mid-November 2025. Finally, the analysis was strengthened by interview results to obtain conclusions.

Research Target / Subject

The population in this study consists of all DHF case data in Alok Timur sub-district as the area with the highest number of cases and Waiblama sub-district with the lowest number of cases in Sikka district in 2016-2024. The subjects selected for interview are dengue fever surveillance officers at the Health Office and community health centers in the study area.

The sampling technique used was purposive sampling. (Nyimbili & Nyimbili, 2024), which was executed by selecting research areas based on the criteria of the largest number of cases and the area with the fewest number of cases over the last 10 years (extreme-case sampling). This region selection was decided to provide a contrasting picture of the influence of environmental and population factors on the number of dengue fever cases. For the interviews, the sample was selected using expert sampling (Firmansyah, 2022; Wahab, 2022), who are DHF surveillance officers.

Procedure

Overall, the research begins with a literature study, then determines the research area, data collection, data processing and analysis, evaluation, analysis of evaluation results,

integrasi, dan berakhir dengan merumuskan kesimpulan.

Secara spesifik, penelitian ini dilakukan dalam dua tahap utama: kuantitatif dan kualitatif, mengikuti desain Explanatory Sequential Mixed Methods. Tahap kuantitatif dimulai dengan pengumpulan data sekunder, termasuk jumlah kasus demam berdarah sebagai variabel respon dan luas bangunan sebagai variabel prediktor dalam desain model. Data tersebut kemudian dianalisis untuk membangun model prediksi awal, yang kemudian dievaluasi dan disempurnakan dengan menambahkan ukuran populasi dan kepadatan populasi sebagai variabel prediktor.

Setelah memperoleh hasil kuantitatif, fase kualitatif diarahkan dengan menganalisis data dari wawancara dengan tenaga kesehatan untuk mengidentifikasi faktor-faktor yang tidak terdapat dalam data numerik yang mempengaruhi hasil prediksi, seperti perilaku komunitas yang menyebabkan akurasi prediksi yang rendah. Kesimpulan yang dicapai adalah bahwa perilaku komunitas merupakan salah satu faktor yang mempengaruhi insidensi demam berdarah. Integrasi hasil kuantitatif dan kualitatif memberikan interpretasi yang komprehensif terhadap temuan penelitian.

Data, Instrumen, dan Teknik Pengumpulan Data

Penelitian ini menggunakan dua jenis data yang dikumpulkan dengan desain Explanatory Sequential Mixed Methods. Data kuantitatif diperoleh dari data sekunder tahun 2016 hingga 2024 untuk setiap wilayah penelitian, meliputi:

1. Jumlah kasus DBD per tahun sebagai variabel respon, yang diperoleh dari Kantor Kesehatan Masyarakat Kecamatan Sikka dan beberapa Puskesmas di wilayah penelitian;
2. Luas total bangunan sebagai variabel prediktor, yang diperoleh melalui aplikasi Google Earth;
3. Jumlah penduduk dan kepadatan penduduk sebagai variabel prediktor, yang diperoleh dari Badan Pusat Statistik Kabupaten Sikka.

Data kuantitatif digunakan untuk membangun model prediktif. Sementara itu, data kualitatif diperoleh dari wawancara terstruktur dengan tenaga kesehatan (surveilans) di Kantor Kesehatan Masyarakat Kecamatan Sikka dan beberapa Puskesmas di wilayah penelitian, mengenai faktor-faktor yang paling sering ditemui di lapangan sebagai penyebab demam berdarah. Hasil wawancara, ditambah dengan hasil observasi lapangan berupa foto-foto keberadaan genangan air dan kebersihan lingkungan, digunakan untuk menjelaskan hasil prediksi sebagai temuan kuantitatif, terutama

terhadap variabel-variabel yang memiliki pengaruh kuat terhadap model prediksi.

Alat yang digunakan untuk mengumpulkan dan menganalisis data kuantitatif meliputi:

1. Google Earth, untuk memperoleh data luas bangunan di wilayah penelitian;
2. Microsoft Excel, untuk mengelola data kuantitatif dan pemodelan manual (sebagai pembandingan dengan model yang dihasilkan dari Python);
3. Python (Google Colabs), untuk membangun model prediksi.

Sementara itu, alat yang digunakan untuk mengumpulkan dan menganalisis data kualitatif meliputi: kuisioner terstruktur sebagai panduan wawancara dan ponsel sebagai alat dokumentasi.

Teknik pengumpulan data kuantitatif yang digunakan dalam penelitian ini meliputi dokumentasi dan verifikasi untuk memastikan konsistensi antar sumber. Teknik pengumpulan data kualitatif meliputi wawancara terstruktur dengan ahli dan observasi di lokasi penelitian.

Teknik Analisis Data

Sesuai dengan desain Explanatory Sequential Mixed Methods, analisis dilakukan dalam tiga tahap, yaitu:

1. Analisis kuantitatif, yang bertujuan untuk membangun model prediktif, dengan langkah-langkah sebagai berikut:
 - a. Tahap pra-pemrosesan, yang diakhiri dengan:
 - 1) Memeriksa inkonsistensi data, terutama jumlah kasus demam berdarah dan data populasi;
 - 2) Membuat variabel turunan (kepadatan penduduk) yang dihitung dengan membagi jumlah penduduk dengan luas area perumahan.
 - b. Tahap kedua adalah mengembangkan model prediksi untuk jumlah kasus DBD berdasarkan luas bangunan dengan menggunakan regresi linier sederhana, yang ditunjukkan dengan persamaan umum berikut:

$$Y = a + bX \quad (1)$$

dimana:

Y = variabel respon (nilai yang diprediksi, dalam hal ini jumlah kasus demam berdarah)

X = variabel prediktor (luas total bangunan di sub-kabupaten)

a = intercept (nilai Y saat X = 0)



- b = regression coefficient (the amount of change in Y for every one unit change in X).
- c. The next step is assessing model employs coefficient of determination value (R^2) and the average value of the prediction error (RMSE). R^2 displays how much of the proportion of variation in the response variable can be explained by the regression model based on its predictor variables.. The R^2 value ranges from 0-1. The larger the R^2 value (closer to 1) exposes the more accurate the prediction model (Chicco, Warrens, & Jurman, 2021). Meanwhile, RMSE measures how big the average error between the value predicted by the model and the actual value, in the same units (Chen & Moraga, 2025). The smaller the RMSE, the better the prediction model.
 - d. After assessing, the next step is enhancing predictor variables in the form of population and population density.
 - e. The next step is forming a prediction model by employing multiple linear regression as shown with this following general equation:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 \quad (2)$$

Where:

Y = number of dengue fever cases in a sub-district

X_1 = total building area in a sub-district

X_2 = number of population in a sub-district area

X_3 = population density in a sub-district area

a = intercept (the value of Y when all X = 0)

b_1 = regression coefficient (average change in the number of DHF cases for every 1 m² increase in building area, with other predictors remaining constant)

b_2 = regression coefficient (average change in the number of DHF cases for each additional person, with other predictors constant)

b_3 = regression coefficient (average change in the number of DHF cases for every one person/km² increase in

density, with other predictors constant).

- f. The last step is re-evaluating the new model using R^2 and RMSE.

The initial model showed inaccurate results. After adding predictor variables, the accuracy improved, but remained low, necessitating exploration of other factors.

2. Qualitative analysis, which aims to explore other factors not captured in the model that contribute to the low accuracy of the prediction model. The analysis was conducted thematically to identify the main factors influencing the number of dengue cases and the dominant themes that emerged related to community lifestyles.
3. The results of the qualitative and quantitative analysis are integrated to provide a comprehensive understanding and to support conclusions.

RESULTS AND DISCUSSION

The prediction model for the number of dengue fever cases was initially built using one predictor variable, namely the building area. Evaluation results indicate that:

1. The R^2 value for Alok Timur sub-district is very low, at 0.10334. This value indicates that building area only had a linear effect of 10.33% in predicting the number of dengue fever cases in Alok Timur sub-district. In contrast, the R^2 value in Waiblama sub-district, is 0.38055. Although theoretically, an R^2 value of >15% is acceptable and meaningful in the health sector due to the complexity of clinical phenomena (many factors influencing the prediction results), the RMSE value should also be considered (Gupta, Stead, & Ganti, 2024). The RMSE value in the Alok Timur sub-district area is 55.24, which means the average difference between the actual value and the predicted value is 55 cases. Conversely, the RMSE value in the Waiblama sub-district area is 2.24. Based on this value, the normalized Root Mean Square Error (nRMSE) value can be calculated using the equation:

$$nRMSE = \frac{RMSE}{Y_{max} - Y_{min}} \quad (3)$$

Where:

Y_{max} = the highest value of the range of values for the number of DHF cases (observe table 1)

Y_{min} = the lowest value of the range of values for the number of DHF cases (observe table 1)

Thus, the nRMSE for East Alok is 31.75% and for Waiblama is 28%. According to forecasting interpretation guidelines, an nRMSE between 20-30% is acceptable. An nRMSE value >30% indicates a less accurate prediction of the number of dengue cases (Wang et al., 2021).

Table 1. Total Building Area and Number of Dengue Fever Victim Data

Year	Total Building Area		Number of Victim	
	Alok Timur	Waiblama	Alok Timur	Waiblama
2016	23298 88.76	180132. 83	70	1
2017	23839 14.92	185793. 29	25	1
2018	24098 46.46	185793. 29	33	0
2019	24553 86.19	220676. 17	97	2
2020	25002 72.49	224559. 42	199	8
2021	25474 05.44	223976. 84	36	0
2022	25815 62.78	227237. 95	74	7
2023	26101 56.12	256798. 47	142	5
2024	24511 99.29	259868. 99	161	5

2. The residual pattern in the graphs (Figure 2 and Figure 3) shows that the original data points are spread far from the regression line, which means that the linear line predicted by the model is not able to explain most of the variation in DHF cases (Lin & Liu, 2022).

Prediksi Kasus DBD berdasarkan Luas Bangunan di kec. Alok Timur-Sikka

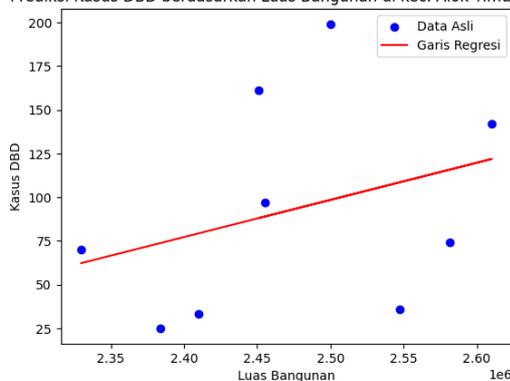


Figure 2. Comparison of Predicted Dengue Fever Cases Based on Building Area with Original Data in Alok Timur-Sikka

Prediksi Kasus DBD berdasarkan Luas Bangunan di kec. Waiblama - Sikka

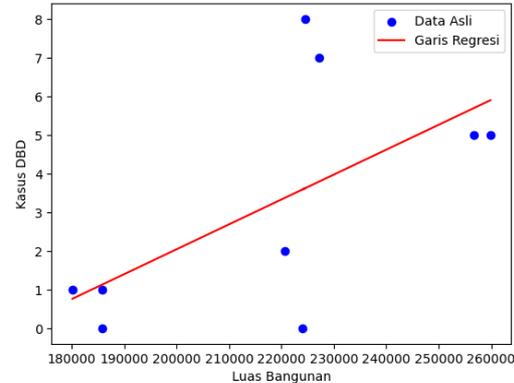


Figure 3. Comparison of Predicted Dengue Fever Cases Based on Building Area with Original Data in Waiblama-Sikka

Based on the evaluation analysis, it is concluded that building area alone is insufficient to accurately predict the number of dengue cases. Therefore, other variables, such as population size and population density, are added to improve model accuracy, resulting in several model variations with varying levels of accuracy. A comparison of model accuracy levels based on R^2 and RMSE values can be seen in Table 2.

Table 2. Comparison of R^2 and RMSE Values Based on Predictor Variables

Predictor	Alok Timur		Waiblama	
	R^2	RMSE	R^2	RMSE
Total building area	0,10334	55,24	0,38055	2,24
Total population	0,00154	58,30	0,34258	2,24
Population density	0,00153	58,30	0,34255	2,24
Total building area + Total population	0,11601	54,85	0,38588	2,24
Total building area + Population density	0,11597	54,85	0,38592	2,24

Total building area + Total population + Population density	0,46974	42,48	0,41024	2,21
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Koefisien (a): 0.00030462547585800723
Intercept (b): -36.9171405332163
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	Luas Bangunan	Jumlah Penduduk	Kepadatan Penduduk	Prediksi Kasus DBD	\
0	2329888.76	33482	360.64	82.024861	
1	2383914.92	33619	362.12	27.448562	
2	2409846.46	33740	363.42	85.419551	
3	2455386.19	32073	345.47	41.579608	
4	2500272.49	32797	353.26	173.691653	
5	2547405.44	32959	355.01	105.204209	
6	2581562.78	33075	356.26	104.961915	
7	2610156.12	33568	361.57	107.846176	
8	2451199.29	34585	372.52	108.823466	

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Kasus DBD Asli
0 70
1 25
2 33
3 97
4 199
5 36
6 74
7 142
8 161
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R2 Score: 0.46974309998751596
Mean Squared Error: 1805.2301573758346
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Figure 4. Original Data and Predicted Results of the Number of Dengue Fever Cases Based on Building Area, Population, and Population Density in Alok Timur-Sikka

Regression analysis shows that building area, population and population density have a stronger influence on the number of dengue fever cases compared to other combinations of predictor variables, in all study locations. The nRMSE value for Alok Timur sub-district decreases from a poor rating (31.75%) to an acceptable rating (24.41%). Meanwhile, for Waiblama sub-district, it remains at the same rating, but with a percentage that also decreased from 28% to 27.63%. The prediction results based on the three predictor variables and the original data on the number of DHF cases for each sub-district can be seen in Figures 4 and 5. Although it shows an increase in the R² value and a decrease in the RMSE and nRMSE values, the R² value is still relatively low and the RMSE is still quite high (as seen in Table 2), and the residual pattern is spread quite far from the regression line (as seen in Figure 6 and Figure 7) indicating that the three variables are only able to explain a small part of the variation in cases, so that the prediction accuracy is still limited. In addition, the predictor variables of population size and population density also have a multicollinearity relationship (Upendra, Abbaiah, & Balasiddamuni, 2023) (as seen from figure 8), thus, it is sufficient to choose one of them as a predictor. The models produced by each predictor can be seen in Table 2, both the R² and RMSE values are almost the same between the two models produced by the population number and population density predictors.

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Koefisien (a): 0.00012073067992240911
Intercept (b): 4.918986125190309
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	Luas Bangunan	Jumlah Penduduk	Kepadatan Penduduk	Prediksi Kasus DBD	\
0	180132.83	7277	50.41	0.789100	
1	185793.29	7299	50.56	2.222789	
2	185793.29	7317	50.69	0.326715	
3	220676.17	8074	55.93	3.216348	
4	224559.42	8074	55.93	3.685175	
5	223976.84	8308	57.55	3.124189	
6	227237.95	8363	57.93	3.668057	
7	256798.47	8536	59.13	6.077744	
8	259868.99	8929	61.85	5.889884	

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Kasus DBD Asli
0 1
1 1
2 0
3 2
4 8
5 0
6 7
7 5
8 5
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R2 Score: 0.41024220293068736
Mean Squared Error: 4.951053111199168
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Figure 5. Original Data and Predicted Results of the Number of Dengue Fever Cases Based on Building Area, Population, and Population Density in Waiblama-Sikka

Prediksi Kasus DBD berdasarkan Luas Bangunan, Jumlah dan Kepadatan Penduduk di kec. Alok Timur-Sik

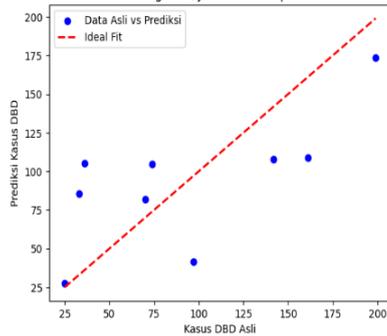


Figure 6. Comparison of Prediction Results of the Number of Dengue Fever Cases Based on Three Predictor Variables with Original Data from Alok Timur-Sikka

Prediksi Kasus DBD berdasarkan Luas Bangunan, Jumlah dan Kepadatan Penduduk di kec. Waiblama-S

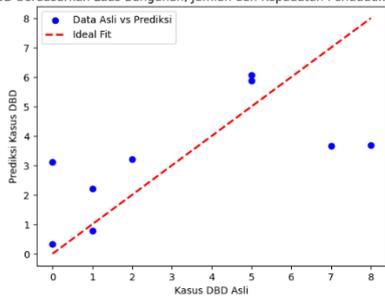


Figure 7. Comparison of Prediction Results of the Number of Dengue Fever Cases Based on Three Predictor Variables with Original Data from Waiblama-Sikka

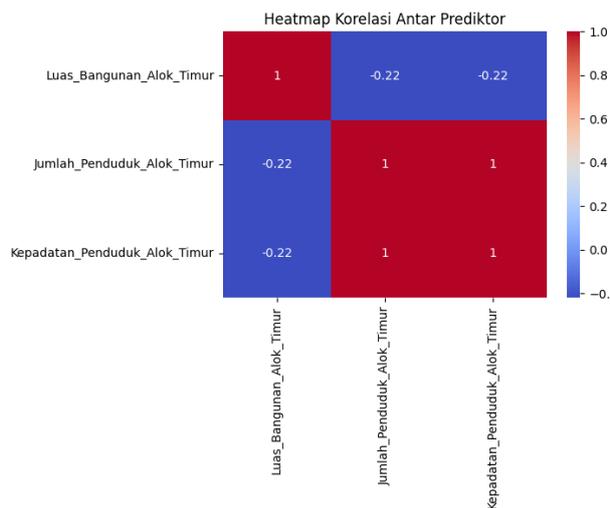


Figure 8. Correlation Between Predictors

The results of interviews with health workers at the Sikka District Health Office and several community health centers in the research area provides additional insight that is not apparent

in the quantitative analysis: community behavior has a significant contribution to DHF cases. Those behaviors are:

1. allowing rubbish to pile up, especially plastic rubbish, which has the potential to collect rainwater;
2. The habit of storing water for a long time without covering it.

This is reinforced by the results of observations in areas with high DHF cases as seen in Figure 9.



Figure 9. Environmental Conditions in Alok Timur District

CONCLUSIONS AND SUGGESTIONS

Conclusion

The variations in prediction models based on physical and demographic environmental variables generated in this study are not optimal. Physical environmental factors (building area) and population density are influential, but not strong enough to accurately predict the number of dengue cases. This indicates that building area, population, and population density do not have a strong correlation with the number of dengue cases in Sikka Regency. Conversely, community behavior is an important factor causing dengue fever that is not captured in the prediction model. Therefore, the development of a model that integrates community behavioral factors is necessary.

Suggestion

Adding other predictor variables to the model is essential, especially those related to community behavior (from survey and interview results) with the intention to increase the accuracy of the model in predicting cases.

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