

Research Article

Logistic Machine Learning for Suicidal Attempt Estimation in a Recent Korean Death Case: Feasibility and Limitations

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Article History	Abstract
Received: August 07, 2026 Accepted: August 29, 2026 Published: September 04, 2026	The probability of suicidal risk is estimated from 18 percent to 25 percent in the case of the recent death of Jang Mi-ran in Korea, by applying a logistic machine learning model trained on the Bangladesh dataset. This death case is a nationwide hot issue in that it is related to the unauthorized close-up of a missing case. This projection is limited because it lacks methodological substantiation; however, under the condition that no reliable forensic evidence and no applicable behavioral dataset are available regarding the cause of death at this moment in Korea, even the mere behavioral conjecture is expected to be a support for the mysterious and tragic death. Keywords: Probability of Suicidal Attempt, Jang Mi-ran, Bangladesh Behavioral Data, Logistic Regression, Machine Learning.

1. Introduction

The Bangladesh model is trained to predict suicidal ideation or attempt, not to classify manner of death [1]. Moreover, risk profiles differ substantially between Bangladesh and Korea: In Bangladesh studies, prominent risk factors include life events, family conflict, marital discord, sexual abuse, and some psychiatric disorders; social and family events often show stronger associations than formal diagnoses [1]. However, Korean studies emphasize mental health problems, perceived burdensomeness, urban residence, and sociocultural stressors among middle-aged and young women [2]. Psychological autopsy comparisons across Asian countries already show that dominant factors differ by country: negative life events in Bangladesh vs mood disorders in Korea [3].

In addition, in Bangladesh, suicide has been criminalized and is under-reported; data sources often rely on police and forensic records, which introduces selection bias [1]. In Korea, death classification follows different forensic and legal procedures, and suicide statistics are compiled differently [4]. More importantly, presenting a model output as evidence that a specific death is “more likely homicide than suicide” can be misleading and potentially harmful in legal contexts.

With these clear-cut limitations in mind, this study tries to figure out the implications of risk-pattern exploration, not a forensic conclusion, capturing the logical background of why normal Korean citizens are constantly and strongly insisting that “It is not a suicide” and why the Korean Police Office changed their stance from “perceived suicide” to “unknown” with the aid of every possible similar pattern, if there is any, since there is no reliable evidence at all.

The woman’s publicly known characteristics, when inserted into a Bangladesh-trained suicide risk model, yield a low probability of suicidal risk, suggesting that her profile shares features with individuals who did not attempt suicide in that dataset. This is the assertion of this study, provided that neither forensic evidence nor the Korean behavioral dataset is available.

In this study, the broader picture of the death case will be described, followed by a comparison of datasets between the Korean Suicide Yearbook 2025 and the Bangladesh dataset to identify similarities and differences. A logistic machine learning model is adopted since it is suitable for the derivation of the probability of a suicidal attempt.

2. The Death Case of a Korean Female

The case centers on 37-year-old Jang Mi-ran, who went missing in May 2026 from Hallim-eup, Jeju City, and whose body was found 104 days later at a palm tree farm very close to where she had been staying; the handling of her missing-person report by a local police officer has triggered a national scandal and multiple investigations.¹

Timeline and Key Facts

Disappearance: Jang Mi-ran was reported missing in mid-May 2026 after leaving her long-term accommodation in Hallim-eup, Jeju City; her boyfriend filed the missing-person report.²

Police Mishandling: A Jeju West Police Station sergeant (surname Bu) is accused of closing the missing-person case within hours, falsely claiming he had spoken with Jang and confirmed she was safe, without verifying her whereabouts.³

Body Discovery: On August 24, 2026, police found a body in a palm tree grove about 500 meters to 1 kilometer from her accommodation—roughly a 10-minute walk away. Personal items including her phone and a gold bracelet were found nearby; no suicide note was discovered.⁴

Identification: The body was confirmed as Jang's through dental records, with DNA analysis also underway; the remains were severely decomposed.⁵

Cause of Death and Investigative Stance

Initial Police View: Early on, Jeju police and some senior officials said the body's position and scene evidence suggested hanging and that there were no apparent signs of foul play, leading many reports to describe the death as a presumed suicide.⁶

Official Reversal: By August 31, 2026, the head of Korea's National Office of Investigation stated that, due to severe decomposition, the exact cause of death could not be determined and that investigators were "keeping all possibilities open," effectively backing away from the earlier suicide framing.⁷

Forensic Findings: The National Forensic Service reportedly found no clear external trauma but could not definitively establish the cause of death; police also conducted a reenactment to test whether the palm branch could support a hanging.⁸

Why the Case Drew National Attention

Police Accountability Scandal: The alleged falsification by Sgt. Bu and the delayed/ineffective search sparked public outrage, leading to his arrest on charges including dereliction of duty and fabrication/use of official records, and prompting broader reviews of nearly 300 missing-person cases on Jeju.⁹

Political Response: President Lee Jae Myung called for greater police accountability and ordered measures to reform police oversight in the wake of the case.¹⁰

"Due to the decomposition of her body, the cause of death is unknown," Hong Seok-ki, head of the National Office of Investigation, told reporters in a briefing. "We are investigating by leaving all possibilities open."¹¹

¹ <https://www.bbc.com/news/articles/cwyz9gjlw9n9o>

² <https://www.koreaherald.com/article/10853028>

³ <https://www.bbc.com/news/articles/cwyz9gjlw9n9o>

⁴ <https://www.bbc.com/news/articles/cwyz9gjlw9n9o>

⁵ <https://en.yna.co.kr/view/AEN20260825010100315>

⁶ <https://www.bbc.com/news/articles/cwyz9gjlw9n9o>

⁷ https://news.sbs.co.kr/english/article.do?news_id=N1008730108

⁸ <https://www.koreaherald.com/article/10855437>

⁹ <https://www.reuters.com/world/asia-pacific/south-koreas-lee-calls-greater-police-accountability-after-jeju-missing-person-2026-08-26/>

¹⁰ <https://www.reuters.com/world/asia-pacific/south-koreas-lee-calls-greater-police-accountability-after-jeju-missing-person-2026-08-26/>

¹¹ <https://en.yna.co.kr/view/AEN20260831006500315>

3. Literature Review

This study does not try to prejudge a real death as homicide from a machine learning model alone or present that conclusion as fact. That would be unsafe and methodologically weak; in the literature, suicide prediction models are used to estimate risk, while determining manner of death requires a forensic investigation, scene evidence, autopsy, and case records, not just classification output [5].

Suicide is a major public health issue in Bangladesh [5]. Yet the country has historically had limited national surveillance and relatively sparse empirical research, prompting recent ecological and psychological autopsy studies to identify determinants of the condition [5]. Studies based on newspaper content analysis reported that many recorded cases involved younger individuals, a high proportion of women, and hanging as the most common method. At the same time, marital and familial discord appeared as a contextual stressor [6]. More rigorous case-control psychological autopsy research in Dhaka found psychiatric disorder, immediate life events, previous suicide attempts, and sexual abuse to be significant risk factors for suicide, with very large odds ratios for life events and prior attempts [7]. Another study estimated large population attributable fractions for life events, mental disorder, depression, sexual abuse, and social isolation, underscoring the strong association between psychological adversity and suicide in Bangladesh [8].

Machine-learning studies in Bangladesh have increasingly used structured behavioral and survey data to predict suicidal ideation or attempt risk, including models trained on student and clinical samples [9]. These studies show that classifiers such as KNN, random forest, logistic regression, and boosting methods can achieve high predictive accuracy for risk classification [9]. Still, they remain limited by dataset representativeness, label quality, and the fact that predictive accuracy does not establish causation or a legal manner of death [9]. Even a well-performing model trained on Bangladesh suicide-risk data cannot be directly generalized to determine whether an individual death in Korea is a suicide or homicide because the population, setting, legal standards, and available features differ substantially [5].

South Korean research also shows that female suicide trends and methods require careful interpretation, and that death classification depends on epidemiologic and forensic evidence, not inference from a single predictive model [10]. For this reason, the present study should be positioned as an exploratory risk-pattern analysis rather than as a conclusion about homicide [10]. Although the model produced a higher posterior probability under the suicide-risk class, classification outputs from a model trained on Bangladesh data cannot be treated as proof of suicide or homicide, and final determination requires forensic investigation and corroborating case evidence” [5].

4. Data

The following Table 1 is from the 2025 Suicide Statistics Yearbook of Korea.

Table 1. Main causes for suicide in 2023, Korea (Source: 2025 Suicide Statistics Yearbook of Korea).

	Total		Male		Female	
	Number	Percent	Number	Percent	Number	Percent
Family issues	692	(4.9)	456	(4.7)	236	(5.5)
Economic life issues	3656	(25.9)	3137	(32.0)	519	(12.1)
Physical health issues	2291	(16.3)	1700	(17.3)	591	(13.8)
Mental and psychiatric issues	5308	(37.7)	2906	(29.6)	2403	(56.1)
Work-related issues	395	(2.8)	327	(3.3)	68	(1.6)
Relationship issues	256	(1.8)	159	(1.6)	97	(2.3)
Bereavement issues	119	(0.8)	75	(0.8)	44	(1.0)
Abuse or violence issues	1	(0.0)	1	(0.0)	0	(0.0)
Etc.	408	(2.9)	307	(3.1)	101	(2.4)
Unknown	963	(6.8)	737	(7.5)	223	(5.2)
Total	14089	(100)	9805	(100)	4281	(100)

Table 2. List of all variables in Bangladesh dataset.

1. Age	2. Gender	3. Religion	4. Occupation
5. Civil status	6. Education level	7. Psychological session	8. Past attempt
9. Disorder	10. Illness	11. Alcohol	12. Anger
13. Sleep problem	14. Isolation	15. Humiliated	16. Sad/wear
17. Attempted or not: Response variable			

Most of all, the subject-wise characteristics are not available in Korean datasets. According to Tables 1 and 2, the critical difference is that the causes of suicides are pinned down or classified from persons who have already committed suicide in the Korean dataset. In contrast, the possible causes are not classified in advance in the Bangladesh dataset, since it is measured to explain whether each subject attempts suicide or not. Moreover, as for the motivations of suicidal attempts, “Family Issues”, “Economic Life Issues”, “Bereavement Issues”, “Relationship Issues”, “Abuse or Violence Issues”, “Etc.” and “Unknown” are not in the Bangladesh dataset of this study.

However, there are strong contextual similarities. “Physical Health Issues” and “Mental and Psychiatric Issues” are more directly linked to the variables in the Bangladesh dataset, such as “Psychological Session”, “Disorder”, and “Illness”. The variables “Civil Status” and “Occupation” in the Bangladesh dataset indirectly encompass “Family Issues”, “Relationship Issues”, “Work-related Issues”, and “Relationship Issues”. Moreover, “Humiliated” in the Bangladesh dataset is closely related to the cause of “Abuse or Violence Issues”.

In addition, Table 3 below exhibits one more similarity: the probability of attempting suicide decreases when a subject changes from undergraduate to graduate in education level, which is also observed in the Bangladesh dataset.

Table 3. Education level of suicide victims in Korea (Source: 2025 Suicide Statistics Yearbook of Korea).

	No education	Elementary school	Middle school	High school	Undergraduate	Graduate	Unknown
Number	459	1636	1475	5022	3734	389	1263
Percent	(3.3)	(11.7)	(10.6)	(35.9)	(26.7)	(2.8)	(9.0)

As for the suicidal attempts in the hospitalized subjects, the Korean dataset only includes age, region, methods, and the month of the attempts at the aggregate level, which limits the model construction trained on the Korean dataset and calls for a model based on the Bangladesh dataset.

Bangladesh dataset presents behavioral data collected for suicide risk prediction research using machine learning [11]. The data were gathered from four major medical institutions in Bangladesh in 2025-2026, including Dhaka Medical College and Hospital, Bangabandhu Sheikh Mujib Medical University, Enam Medical College and Hospital, and Shaheed Tajuddin Ahmad Medical College [11]. The dataset contains structured behavioral indicators obtained through clinical and survey-based methods [11]. It is intended to support research in mental health assessment, risk prediction modeling, and the development of machine learning algorithms for early identification of suicide risk [11]. All data have been collected in accordance with appropriate ethical considerations and are provided for academic and research purposes [11]. This resource aims to contribute to data-driven mental health research and predictive analytics in healthcare [11].

By applying a label encoder, categorical variables are converted to numeric values as in Table 4. After label encoding, there are 22 features, including the response variable, regarding the behavioral characteristics related to a suicidal attempt. The values of 23 subjects are excluded due to missing values. When subjects' ages are given as a range, median values are used. For the categorical variable of “Disorder”, 5 dummy variables consisting of 0 and 1 are constructed to examine the specific effect of each mental disorder type.

Table 4. Summary statistics of Bangladesh dataset.

	Unnamed: 0	Age	Gender	Religion	Occupation	Civil Status	Education Level	Psych Session	Past Attempt	Depression
count	1106.000000	1106.000000	1106.000000	1106.000000	1106.000000	1106.000000	1106.000000	1106.000000	1106.000000	1104.000000
mean	552.500000	49.276673	0.686257	2.235986	20.502712	0.779385	3.178119	0.222423	0.481917	0.181159
std	319.419004	22.729799	0.464223	1.283874	11.809671	1.335275	1.872379	0.416062	0.499899	0.385325
min	0.000000	10.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25%	276.250000	28.000000	0.000000	1.000000	6.000000	0.000000	2.000000	0.000000	0.000000	0.000000
50%	552.500000	49.500000	1.000000	3.000000	24.000000	0.000000	3.000000	0.000000	0.000000	0.000000
75%	828.750000	69.000000	1.000000	3.000000	28.000000	1.000000	3.000000	0.000000	1.000000	0.000000
max	1105.000000	98.000000	1.000000	4.000000	36.000000	5.000000	8.000000	1.000000	1.000000	1.000000

8 rows × 22 columns

5. Logistic Model Construction and Application

The key advantage of the Bangladesh dataset is that it explicitly includes “Attempt or not” as a response variable, which is not available in Korean datasets. Moreover, many features used as explanatory variables are easy to gather from public news media without concern for protecting private information. With a standard of p-values less than 0.001, six features such as Gender, Occupation, Civil Status, Education Level, Psychological Session, and Past Attempt are selected as significant by applying backward selection. To apply the model to the case of a recent death in Korea, the variable Occupation is omitted without compromising overall performance, as measured by the confusion matrix in Figure 1, since its possible projected values are too broad. The performance of this machine learning model is somewhat too high, with accuracy, precision, recall, and F1 score all approximately 1, indicating the possibility of overfitting. The education level of the person in our investigation is not publicly reported; however, since high school education is almost mandatory in Korea, only 5, 6, and 7 are reliable values for this case. Since using the numeric value 7 increases the probability of non-attempt, only the values 5 and 6 are compared. The resulting probabilities of suicidal attempts and plausible conclusions are given in Table 5. As is publicly known, the input values for both the psychological session and the past attempt are all 0. Input values of 1 for these variables are included for comparison.

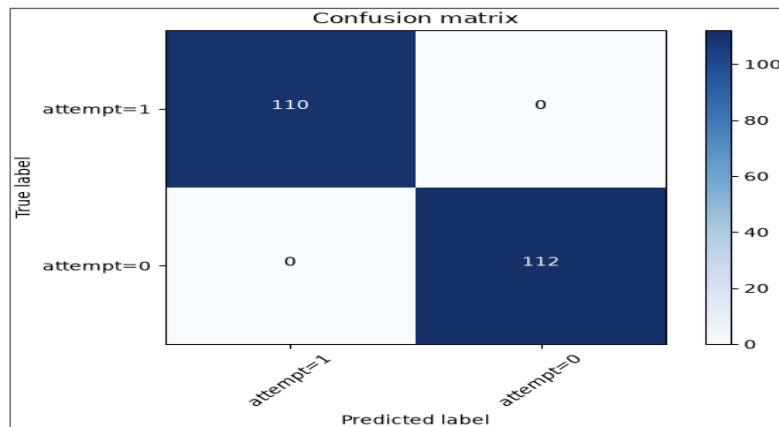


Figure 1. Confusion matrix with 5 explanatory variables.

Table 5. Probabilities of suicidal attempts estimated by logistic machine learning model.

Gender	Civil status	Education	Psychological session	Past attempt	Probability of suicidal attempt	Model prediction
0	3	6	0	0	18%	Not attempted
0	3	5	0	0	21%	Not attempted
0	3	5	0	1	52%	Not attempted
0	3	6	1	0	25%	Not attempted
0	3	5	1	1	61%	Attempted

*Civil status = 3 since relationship is reported publicly
 *Education = 6 if undergraduate degree is acquired, which is not reported
 *Education = 5 if high school graduate, which is not reported
 * Psychological session = 0 since it is reported
 * Psychological session =1 to compare the outcomes, although it is not true
 * Past attempt = 0 since it is reported
 * Past attempt = 1 to compare the outcomes, although it is not true

6. Conclusion

This study applies a machine learning model trained on Bangladesh suicide-risk data to examine whether the observed characteristics are less consistent with elevated suicide risk than with a non-suicide profile; however, the model cannot determine the manner of death. Therefore, this study is strictly limited by the methodological mismatch in applying risk factors from Bangladesh to a specific case in Korea, the limitations of ML prediction, and the need for forensic confirmation in Korean death investigations. As many Korean citizens cast doubt about the hasty projection of a suicide along with the change in the stance of the police department from projected suicide to undetermined, the probability of a suicidal attempt based on behavioral patterns measured in Bangladesh data is quite low, from 18 percent to 25 percent. Only in the case where the person has a psychological session experience and past suicidal attempts does the probability of a suicidal attempt go above the threshold level, suggesting a model prediction of a suicidal attempt, regardless of the actual suicidal commitment. But neither of these two conditions is verified at all.

Declarations

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