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# Timeliness of Death Certificate Data for Suicides

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## Abstract

*Objectives*—This report evaluates the lag time between the week a suicide occurred and the week when information on the death certificate became available for the National Center for Health Statistics (NCHS) mortality surveillance program.

*Methods*—Suicides occurring from March 2016 through July 2016 were grouped by the week the death occurred (i.e., the reference week) for a total of 20 reference-week units. The analysis calculated the percentage of suicide death certificate records that were available in NCHS' database for 52 subsequent weeks following each reference week. The mean percentage of the records available for analysis across the 20 reference-week units at each subsequent week is reported by suicide method and sex.

*Results*—The study included death certificate records for 18,788 suicides. In the study period, 71.0% of all death certificate records for suicides were available by 13 weeks (1 quarter), 92.9% by 26 weeks (2 quarters), and 98.6% by 39 weeks (3 quarters). Timeliness of death certificate records varied by suicide method. For firearm-related suicides, 85.6% of all records were available by 13 weeks, 97.6% by 26 weeks, and 99.5% by 39 weeks. For suicides involving suffocation, 70.1% of all records were available by 13 weeks, 94.3% by 26 weeks, and 99.0% by 39 weeks. For suicides involving drug poisoning, 24.8% of all records were available by 13 weeks, 74.1% by 26 weeks, and 93.9% by 39 weeks. For male suicides, 74.2% of all records were available by 13 weeks, 94.2% by 26 weeks, and 98.9% by 39 weeks. For female suicides, 60.0% of all records were available by 13 weeks, 88.7% by 26 weeks, and 97.5% by 39 weeks.

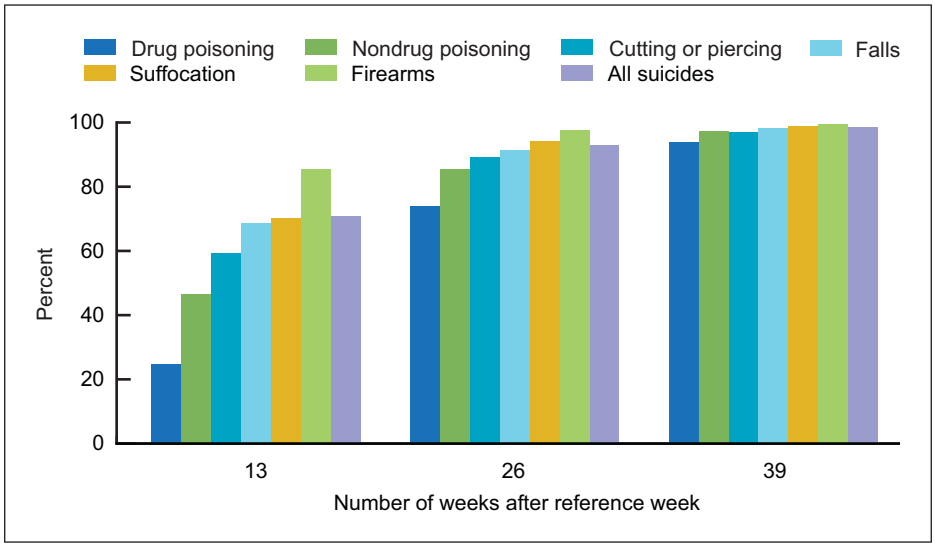
*Conclus*ions—Timeliness of when suicide death certificate data become available for analysis differs by suicide method and sex. These differences in lag time between when a suicide occurs and when information from the certificate is available for analysis should be taken into account when interpreting provisional suicide estimates.

**Keywords:** mortality surveillance • timeliness • National Vital Statistics System

## Introduction

The National Center for Health Statistics (NCHS) collects and disseminates the nation's official vital statistics through the National Vital Statistics System (NVSS). NVSS refers to the intergovernmental sharing of vital records data between NCHS and state vital registration offices. Through NVSS, 57 jurisdictions, which include all 50 states, New York City, the District of Columbia, and five U.S.

Figure 1. Mean percentage of available suicide death certificate records at 13-, 26-, and 39-week quarterly thresholds, by suicide method: United States, March 2016–July 2017




NOTES: Mean percentage refers to the sum of the percentages of available suicide records (i.e., suicide records in a given week over suicide records at 52 weeks) across the 20 reference-week units divided by the total number of reference-week units. A reference-week unit is defined as the week a set of deaths occurred.
SOURCE: NCHS, National Vital Statistics System, March 2016–July 2017.

territories, send birth and death data to NCHS. Data are then processed and datasets are created through coding, validation, and other standardization processes. NCHS serves as the custodian and distributor of national vital statistics in the United States and produces annual national natality and mortality statistics. NCHS also uses provisional vital statistics data in near real time for conducting public health surveillance, and it publishes provisional estimates based on data it receives and processes by a specified cut date.

The timeliness of provisional mortality surveillance data in NVSS varies by cause of death (1). The lag time (i.e., the length of time between the week a death occurred and the week when information on the death certificate became available for NCHS mortality surveillance) is longer for injury-related deaths compared with noninjury-related deaths. This report further explores the differences in timeliness of death certificate data by method of suicide.

In this report, method of suicide includes firearm, suffocation (including hanging), drug poisoning, nondrug poisoning, cutting or piercing, and falls. Given the observed greater lag time for drug-poisoning deaths in the previous timeliness report (1), the lag time for suicide data is expected to differ by suicide method. This report also presents the timeliness of suicide data by sex, as the method of suicide varies by sex and thus the timeliness of suicide data may differ by sex (2). For example, suicides by males are more likely to involve firearms, whereas suicides by females are more likely to involve drug poisoning. This report describes the lag time for suicide records entering the NVSS database from March 2016 through July 2017.

## Methods

NCHS creates a static file at the end of each week with death certificate records received to date for deaths occurring in the previous 24 months (referred to as a snapshot). These snapshots, which contain all death certificate records received from all 50 states, New York City, and the District of Columbia, are sorted by the week the death occurred, which enables NCHS to make static comparisons of when death records become available over time after a death occurred. Using these weekly snapshots, this report describes the timeliness of suicide death certificate records.

Suicides occurring from March 2016 through July 2016 were grouped by the week the death occurred (i.e., the reference week), for a total of 20 reference weeks. The percentage of death certificate records available for analysis for that week of death in the NVSS database was calculated for 52 subsequent weeks following each reference week. Deaths were classified by the *International Statistical Classification of Diseases and Related Health Problems*, tenth revision (ICD–10) code for the underlying cause of death. Suicides were identified with the following ICD–10 codes: U03, X60–X84, and Y87.0, and were reported by suicide methods and sex. See Technical Notes for details.

For each reference-week unit, the percentage of suicide records available for analysis for every subsequent week was calculated by dividing the total number of available suicide death certificate records at each week by the total number of available suicide records at the 52nd week. The total number of suicide death certificate records received at 52 weeks is an estimation of the true number of deaths occurring in a reference week. This report presents the mean percentage of suicide records available for analysis across the 20 reference-week units by suicide method and sex. Detailed methodology is described in a previous report (1).

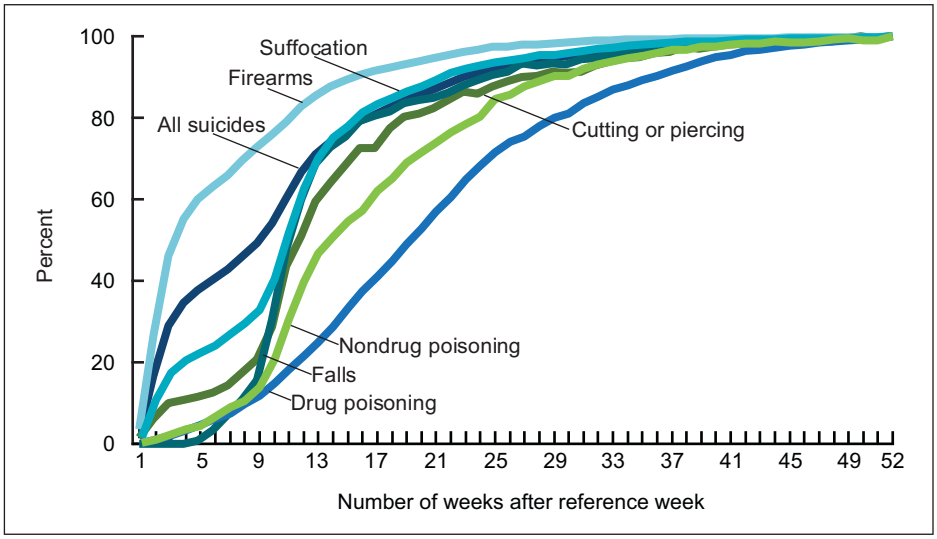
## Results

The study included death certificate records for 18,788 suicides. Among suicides in the study period, 50.9% listed firearm as the suicide method, 25.4% listed suffocation, 11.5% listed drug poisoning, 3.7% listed nondrug poisoning, 2.4% listed falls, 1.9% listed cutting or piercing, and 4.3% listed miscellaneous or other.

The mean percentages of available suicide death certificate records are reported at 13-, 26-, and 39-week thresholds to align with NCHS' quarterly provisional estimates of mortality (Figure 1, Table). In the study period, 71.0% of death certificate records for deaths due to suicide were available by 13 weeks (1 quarter), 92.9% by 26 weeks (2 quarters), and 98.6% by 39 weeks (3 quarters). Timeliness varied by suicide method. Among suicides involving firearms, on average, 85.6% of death certificate records were available by 13 weeks, 97.6% by 26 weeks, and 99.5% by 39 weeks. Among suicides involving suffocation, on average, 70.1% of death certificate records were available by 13 weeks, 94.3% by 26 weeks, and 99.0% by 39 weeks. For suicides involving drug poisoning, on average, 24.8% of records were available by 13 weeks, 74.1% by 26 weeks, and 93.9% by 39 weeks. Death certificate data for suicides involving nondrug poisoning, falls, and cutting or piercing were more timely than the data for suicides involving drug poisoning but less timely than the data for suicides involving suffocation. Figure 2 shows the timeliness of available death records by suicide method and the week the data entered NVSS.

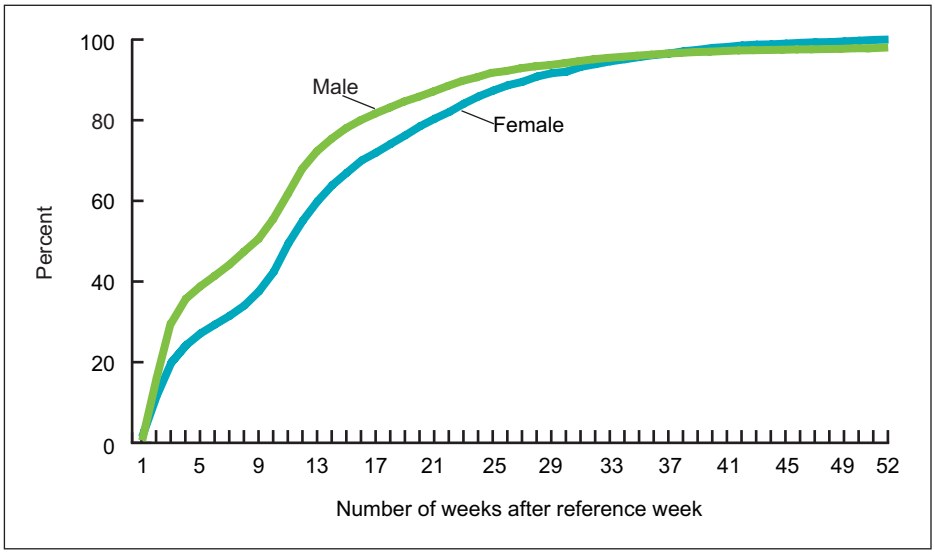
For male suicides, an average of 74.2% of records were available at 13 weeks, 94.2% at 26 weeks, and 98.9% at 39 weeks (Table, Figure 3). For female suicides, 60.0% of records

Figure 2. Mean percentage of suicide death certificate records available for analysis by each week after the reference week, by suicide method: United States, March 2016–July 2017




NOTES: Mean percentage refers to the sum of the percentages of available suicide death certificate records (i.e., suicide death certificate records in a given week over suicide death certificate records at 52 weeks) across the 20 reference-week units divided by the total number of reference-week units. A reference-week unit is defined as the week a set of deaths occurred.
SOURCE: NCHS, National Vital Statistics System, March 2016–July 2017.

Figure 3. Mean percentage of suicide death certificate records available for analysis by each week after the reference week, by sex: March 2016–July 2017




NOTES: Mean percentage refers to the sum of the percentages of available suicide death certificate records (i.e., suicide death records in a given week over suicide death records at 52 weeks) across the 20 reference-week units divided by the total number of reference-week units. A reference-week unit is defined as the week a set of deaths occurred.
SOURCE: NCHS, National Vital Statistics System, March 2016–July 2017.

were available at 13 weeks, 88.7% at 26 weeks, and 97.5% at 39 weeks.

## Discussion

The timeliness of data on suicides varied by suicide method. Death record data for firearm-related suicides were timelier than data for suicides involving other methods. The longest lag time was observed for suicide data involving drug poisoning. There is a difference in timeliness between male and female suicides in the first few weeks after a death occurs, but this difference is minimal after 39 weeks when provisional estimates are reported. These results indicated that if provisional data on suicides were presented earlier than 39 weeks, the reported data may disproportionately represent male suicides and firearm suicides. Female suicides and suicides involving drug overdose would be underreported, and the provisional estimates may not be reliable and valid. This analysis confirms the need for a 9-month lag time in reporting provisional suicide death data. Provisional estimates on suicides made without adequate lag time would underrepresent the actual number of suicide deaths; underreporting for certain suicide methods would be even more pronounced when analyzing suicides by method. Future data releases, including expansion of provisional data releases to include the estimates by suicide method or sex, should take into account the lag time of such variables.

This study has some limitations. To be consistent with the previous report, only the overall frequencies were reported for each snapshot. In addition, the total number of suicide death certificate records received at 52 weeks is an estimation of the true number of deaths occurring in a reference week of 2016. It is possible that some suicides, and in particular suicides involving drug poisoning, may take more than a year to investigate the cause of death and finalize the death certificate, and therefore, the true total number of suicides involving such methods may be undercounted.

Despite these limitations, this study provides context to suicide data that will aide in the interpretation of provisional estimates. Timeliness in the reporting of suicides varies by suicide method. Subsequent differences among patterns of suicide methods may affect how provisional suicide deaths data are interpreted. Understanding this potential effect is useful in ongoing suicide surveillance efforts.

# References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4. National Center for Health Statistics. National Vital Statistics System. Instructions for classifying the underlying cause of death. 2017.

**Table. Mean percentage of available suicide death certificate records at 13-, 26-, and 39-week quarterly thresholds, by suicide method and sex: United States, March 2016–July 2017**

| Suicide method | 13 weeks | | 26 weeks | | 39 weeks | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| All suicides | 74.2 | 60.0 | 94.2 | 88.7 | 98.9 | 97.5 |
| Cutting or piercing | 60.4 | 50.7 | 88.5 | 88.1 | 96.8 | 97.7 |
| Falls | 67.4 | 74.2 | 92.1 | 89.6 | 98.9 | 95.6 |
| Firearms | 85.4 | 86.5 | 97.6 | 97.1 | 99.6 | 99.3 |
| Drug poisoning | 25.8 | 24.4 | 74.2 | 74.2 | 93.7 | 93.9 |
| Nondrug poisoning | 46.8 | 49.5 | 85.1 | 88.6 | 96.5 | 99.9 |
| Suffocation | 70.0 | 70.3 | 94.2 | 94.5 | 99.2 | 98.4 |

NOTES: Mean percentage refers to the sum of the percentages of available suicide death certificate records (i.e., suicide death certificate records in a given week over suicide death certificate records at 52 weeks) across the 20 reference-week units divided by the total number of reference-week units. A reference-week unit is defined as the week a set of deaths occurred.

SOURCE: NCHS, National Vital Statistics System, March 2016–July 2017.

# Technical Notes

## Nature and sources of data

Since 2014, the National Center for Health Statistics (NCHS) has taken weekly snapshots of its mortality data, which include death certificate records from all 50 states, New York City, and the District of Columbia. During the study period (March 2016–July 2017), NCHS was unable to capture one snapshot, which occurred on August 21, 2016. This affected the reference-week units' percentage of death records at different time points that were available for analysis, since the number of weeks would differ based on when the death week occurred. If the percentage of death certificate records that were available for analysis could not be determined for a particular week, the value was treated as missing, and thus, the weekly mean percentage of records available for analysis was calculated using the remaining percentages of available death records. Records that did not provide a specific date of death were not analyzed, since these could not be assigned to a specific reference week.

## Cause-of-death classification

Mortality statistics are compiled in accordance with World Health Organization (WHO) regulations specifying that WHO member nations classify and code causes of death in accordance with the current revision of the *International Statistical Classification of Diseases and Related Health Problems*, tenth revision (ICD–10) (3). Causes of death are coded according to ICD guidelines described in annual issues of Part 2a of the NCHS Instruction Manual (4). For the purposes of this study, NCHS focused entirely on the underlying cause of death ICD–10 codes. Suicides are identified using the following ICD–10 codes: U03, X60–X84, and Y87.0. The following groupings were developed to examine suicides by method: cutting or piercing (X78), falls (X80), firearms (X72, X73, X74), drug poisoning (X60–X64), nondrug poisoning (X65–X69), and suffocation (X70). Provisional data on cause of death are subject to some nonrandom sampling error. This is because the delay in receiving the report of a death depends on the cause of death. Furthermore, for some deaths, the final cause may not be available at the time the death was reported. In those cases, the causes of death may be reported as unknown or pending investigation and coded to the ICD–10 code R99 (other ill-defined and unspecified causes of mortality). In the final data, some of the deaths with unknown cause will be reassigned to specific causes if further, more specific cause-of-death information is provided.

### Suggested Citation

Ahmad FB, Spencer MR. Timeliness of death certificate data for suicides. Vital Statistics Rapid Release; no 3. Hyattsville, MD: National Center for Health Statistics. April 2018. Available from: https://www.cdc.gov/nchs/data/vsrr/report003.pdf.



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