

# 2024 Network of Patient Safety Databases Chartbook:

## Medication and Other Substance Events



# **2024 NETWORK OF PATIENT SAFETY DATABASES CHARTBOOK: MEDICATION AND OTHER SUBSTANCE EVENTS**

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## **ACKNOWLEDGMENTS**

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Specifically, we thank:

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## **ABOUT THE NPSD**

The Network of Patient Safety Databases (NPSD) provides an interactive, evidence-based management resource for healthcare providers, Patient Safety Organizations (PSOs), and others. The U.S. Department of Health & Human Services was authorized to create the NPSD by the [Patient Safety and Quality Improvement Act of 2005 \(PSQIA\)](#), and it is implemented by the Agency for Healthcare Research and Quality (AHRQ), the lead federal agency for patient safety.

AHRQ developed the Common Formats, a standardized reporting format using common language and definitions, to collect information about patient safety events and concerns from across the nation. PSOs collect voluntary reports from healthcare providers and submit data to the PSO Privacy Protection Center (PSOPPC). The PSOPPC ensures the Common Formats data are non-identifiable before being sent to the NPSD for aggregation and analysis. Because the NPSD contains a large volume of standardized, non-identifiable patient safety data from multiple sources across the country, it is a unique and valuable resource for research and learning about how to improve patient safety and prevent patient harm. These data can then be used to identify trends and patterns in patient safety concerns, and to provide insight into how to mitigate patient safety risks and reduce harm across healthcare settings nationally. Each provider and PSO that participates by contributing data advances knowledge about patient safety.

## **Data and Analysis Available at the NPSD**

Submission of patient safety event data is completely voluntary. The NPSD data are not statistically comparable to clinical quality measures. For example, the data from clinical quality measures reported by agencies such as the Centers for Medicare & Medicaid Services (CMS) and the Centers for Disease Control and Prevention (CDC), which may focus on all eligible members of a population, can establish denominators, and calculate rates of occurrence. Voluntary patient safety reporting systems are, however, marked by variability in the rate and consistency of reporting, and denominators are typically unavailable. Hence, the event report data submitted to the NPSD cannot be used to calculate the actual incidence or prevalence of patient safety events. Finally, Chartbooks derived from NPSD data only summarize data submitted using Common Formats for Event Reporting-Hospitals (CFER-H). While it is believed that CFER-H are primarily used as intended to capture patient safety events in hospital settings, providers may also have used the CFER-H to report data from other settings.

## **NPSD Chartbook Text Formatting**

The text of the NPSD Chartbook has been formatted to assist readers in recognizing when the discussion relates to a Common Formats Event-Specific Module, Data Element, and Answer Value. Event-Specific Modules represent the nine distinct modules of the CFER-H (e.g., *Medication or Other Substance*). Data Elements (abbreviated DE) refer to the concepts reported in the CFER-H and are captured through individual questions asked of those who report each patient safety concern (e.g., “What was the incorrect action?” or **TYPE OF INCORRECT ACTION**). Answer Values represent the unique response options for each Data Element. For example, DE288: “Which of the following best characterizes the event?” has four Answer Values: *Incorrect action*; *Unsafe condition*; *Adverse reaction*; and *Unknown*.

## INTRODUCTION

The Common Formats include event-specific modules for nine patient safety event types that represent the majority of reported preventable injuries that happen in hospitals. Medication events account for 25% of all patient safety events reported to the NPSD. This 2024 Network of Patient Safety Databases Chartbook: Medication and Other Substance Events represents a comprehensive look at all medication and other substance events submitted to the PSOPPC using CFER-H Version 1.2 through December 31, 2023. This standalone Chartbook enhances the ability to identify patterns in medication or other substance patient safety concerns and provides insights on how to mitigate related patient safety risks to reduce harm nationally.

## Highlights

- Roughly 36 percent of medication events were reported to have originated in the administering stage and roughly 27 percent in the prescribing stage.
- The majority of medication events submitted were incidents (i.e., the event reached the patient).
- Medication incidents where an incorrect action was specified resulted in harm to the patient five and a half percent of the time.
- Incorrect dose was the most commonly known and specified incorrect action.
- Human contributing factors such as fatigue, stress, inattention, cognitive factors, and/or health issues experienced by medical staff accounted for 11.7 percent of incidents where the incorrect action was incorrect dose.
- Communication and staff qualifications accounted for 4.1 percent and 3.1 percent, respectively, of incidents where the incorrect action was incorrect dose.
- Incorrect patient/family action (e.g., self-administration error) was the most commonly reported incorrect action for near misses.

## MEDICATION OR OTHER SUBSTANCE EVENTS OVERVIEW

A *Medication or Other Substance* event is defined as an event involving “medications, biological products, nutritional products, or medical gases.” The scope of reporting for the CFER-H V1.2 *Medication or Other Substance* event includes more specifically events involving medications, biological products, nutritional products, expressed human breast milk, medical gases, and contrast media. The following are excluded from *Medication or Other Substance* event type reporting:

- Adverse drug reaction with no apparent incorrect action
- Patient food (not suspected in drug-food interactions)
- Radiopharmaceuticals
- Appropriateness of therapeutic choice or decision making (e.g., physician decision to prescribe medication despite known drug-drug interaction)
- Drug-drug, drug-food, or adverse drug reaction as a result of a prescription and/or administration of a drug and/or food prior to admission

The data presented in this report include all 486,543 *Medication or Other Substance* events in CFER-H V1.2, excluding the conditions above, that were submitted to the PSOPPC through December 31, 2023.

The *Medication or Other Substance* event type in CFER-H V1.2 is designed to collect information on *Incidents*, *Near Misses*, and *Unsafe Conditions* related to *Medication or Other Substance* events. This pertains to both hospital inpatient and outpatient pharmacies. *Medication and Other Substance* reports were divided into three groups: *Incident* where the event reached the patient, whether or not the patient was harmed; *Near Miss* where the event did not reach the patient; and *Unsafe Condition*, which is any circumstance that increases the probability of a patient safety event.

If the event reaches the patient, information regarding the patient's outcome is captured through AHRQ's Harm Scale. The AHRQ Harm Scale captures *Residual harm* to the patient after any intervention to reduce harm. While the AHRQ Harm Scale provides the following possible responses: *No harm*, *Mild harm*, *Moderate harm*, *Severe harm*, *Death*, or *Unknown* harm, due to small counts across the categories of *Moderate* to *Severe* harm, this Chartbook displays *Medication or Other Substance* events where the **EXTENT OF HARM** is categorized as *No harm*, *Harm* (i.e., *Mild harm*, *Moderate harm*, *Severe harm*, or *Death*), or *Unknown harm*.

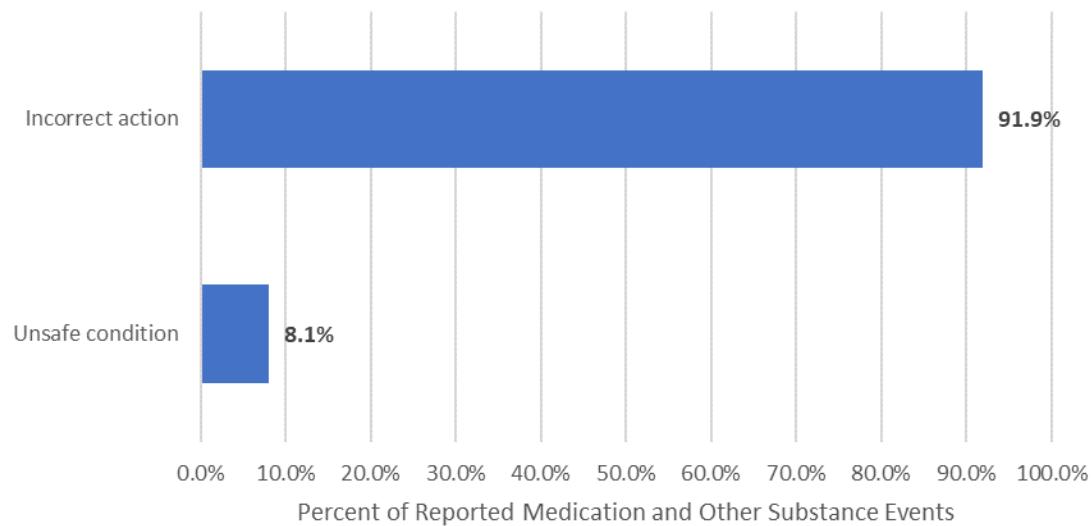
Important information for the analyses below is provided in the Technical Notes in Appendix A.

## Description of Medication or Other Substance Events

The following figure displays reports of *Medication or Other Substance* event descriptions. *Medication or Other Substance* events were divided into the following four description groups: *Incorrect action* including process failures or errors (e.g., such as administering overdose or incorrect medication), *Unsafe condition* which excludes *Incidents* or *Near Misses*, *Adverse reaction* in a patient to the administered substance without any apparent incorrect action, and *Unknown*. An example of an *Unsafe condition* includes an expired or deteriorated substance found on routine inspection.

For the majority of *Medication or Other Substance* events, data were missing (i.e., not reported) for **DESCRIPTION OF SUBSTANCE EVENT** (322,271 of 486,543 reported events). Among *Medication or Other Substance* event reports with complete event descriptions, the majority were described as an *Incorrect action* (91.9%; 151,025 / 164,272). The remainder of this report will reflect a focus on *Medication or Other Substance* reports described as an *Incorrect action*.

**Figure 1: Description of Medication or Other Substance Events**

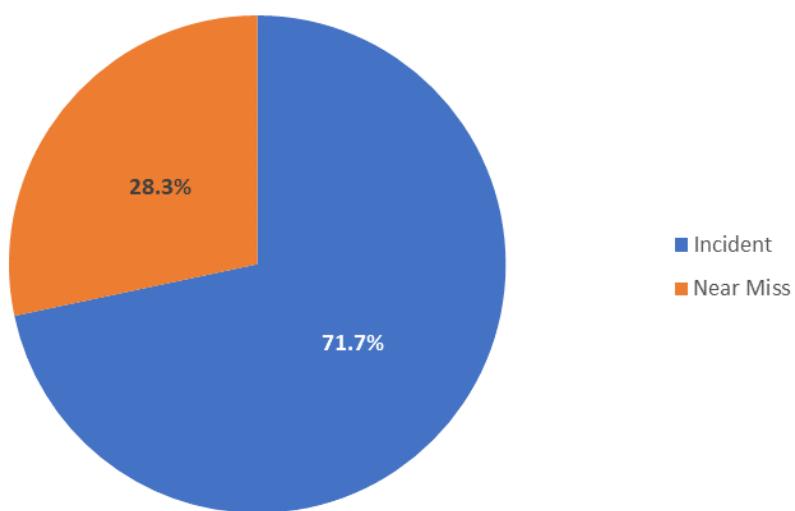


**Notes:** Counts and percentages taken from *Medication and Other Substance* events through December 31, 2023 where valid, non-missing information for **DESCRIPTION OF SUBSTANCE EVENT** was reported. N=164,272. Percentages may not sum to 100% due to rounding.

### Incorrect Action Safety Concerns

The following figure displays the types of safety concerns for *Medication or Other Substance* events described as an *Incorrect action*. An example of an *Incorrect action Incident* is the administering of an incorrect medication to a patient. If the incorrect medication is prescribed to a patient, but the *Incorrect action* is caught and rectified before reaching the patient, it is a *Near Miss*. The majority of *Incorrect action Medication or Other Substance* events were *Incidents* (71.7%; 108,237 / 151,025).

**Figure 2: Incorrect Action by Type of Safety Concern**

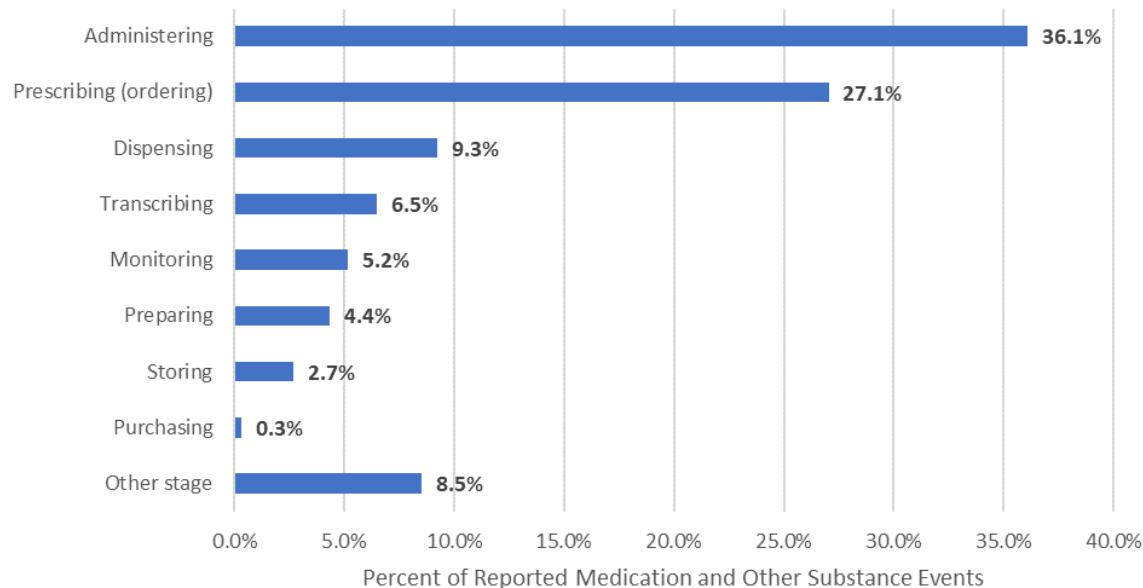


**Notes:** Counts and percentages taken from *Medication and Other Substance* events through December 31, 2023 where **DESCRIPTION OF SUBSTANCE EVENT** was reported to be *Incorrect action*. N= 151,025. Percentages may not sum to 100% due to rounding.

## Medication or Other Substance Event Origin

This figure displays the stage of origin for *Medication or Other Substance* events. Where stage of event origin was known and specified, roughly 36% of *Medication or Other Substance* events were reported to have originated in the *Administering* stage (29,537 / 81,818) and 27% in the *Prescribing (ordering)* stage (22,133 / 81,818).

**Figure 3: Stage of Medication or Other Substance Event Origin**

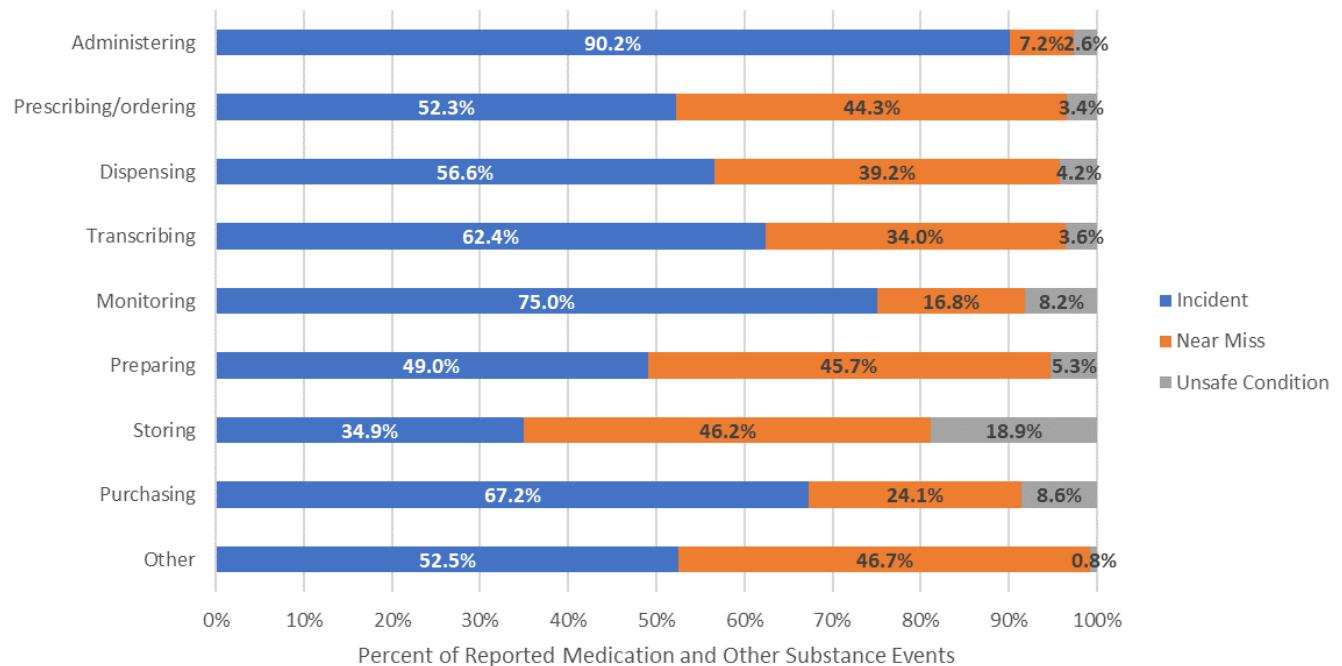


**Notes:** Counts and percentages taken from *Medication and Other Substance* events through December 31, 2023 where non-missing information was available for **STAGE EVENT ORIGINATED**. N=81,818. *Unknown* reported stage of origin was excluded from analysis. Percentages may not sum to 100% due to rounding.

## Origin of Safety Concerns

This figure presents the distribution of safety concern types for *Medication or Other Substance* event stages of origin. Overall, with the exception of the *Storing* stage, *Incident* is the most commonly occurring safety concern (64.0%; 105,940 / 165,438). *Near Miss* was the most common safety concern for *Medication or Other Substance* events originating in the *Storing* stage (42.7%; 1,368 / 3,201).

**Figure 4: Stage of Origin by Safety Concern**



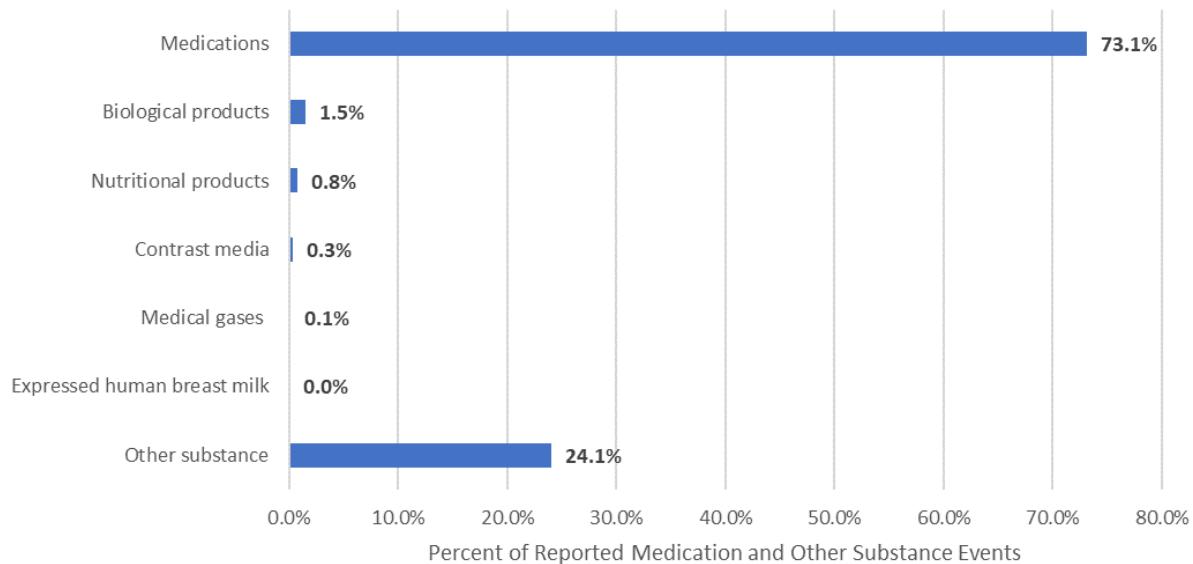
**Notes:** Counts and percentages taken from *Medication and Other Substance* events through December 31, 2023 where **STAGE EVENT ORIGINATED** and safety concern were reported. N=165,438. Percentages may not sum to 100% due to rounding.

### Type of Medication or Other Substance Involved

The following figure displays the type of medication or substance involved in *Medication or Other Substance* events.

Roughly 75% of all *Medication and Other Substance* events where **TYPE OF SUBSTANCE** was known involved *Medications* (130,434 / 172,110). *Medications* can include prescription drugs, over-the-counter drugs (including herbal supplements), compounded preparations, and investigational drugs. *Biological Products* comprised 1.5% of *Medication or Other Substance* events where **TYPE OF SUBSTANCE** was known (2,470 / 172,110). *Biological products* include any virus, therapeutic serum, toxin, antitoxin, or analogous product applicable to the prevention, treatment or cure of disease or injury. *Nutritional products* (1,275 / 172,110), *Contrast media* (579 / 172,110), *Medical gases* (204 / 172,110), and *Expressed human breast milk* (61 / 172,110) individually accounted for less than 1% of *Medication or Other Substance* events where **TYPE OF SUBSTANCE** was known.

**Figure 5: Type of Medication or Other Substance Involved**



**Notes:** Counts and percentages taken from *Medication and Other Substance* events through December 31, 2023 where non-missing information was available for **TYPE OF SUBSTANCE**. N=172,110. Percentages may not sum to 100% due to rounding.

## MEDICATION OR SUBSTANCE INCIDENTS

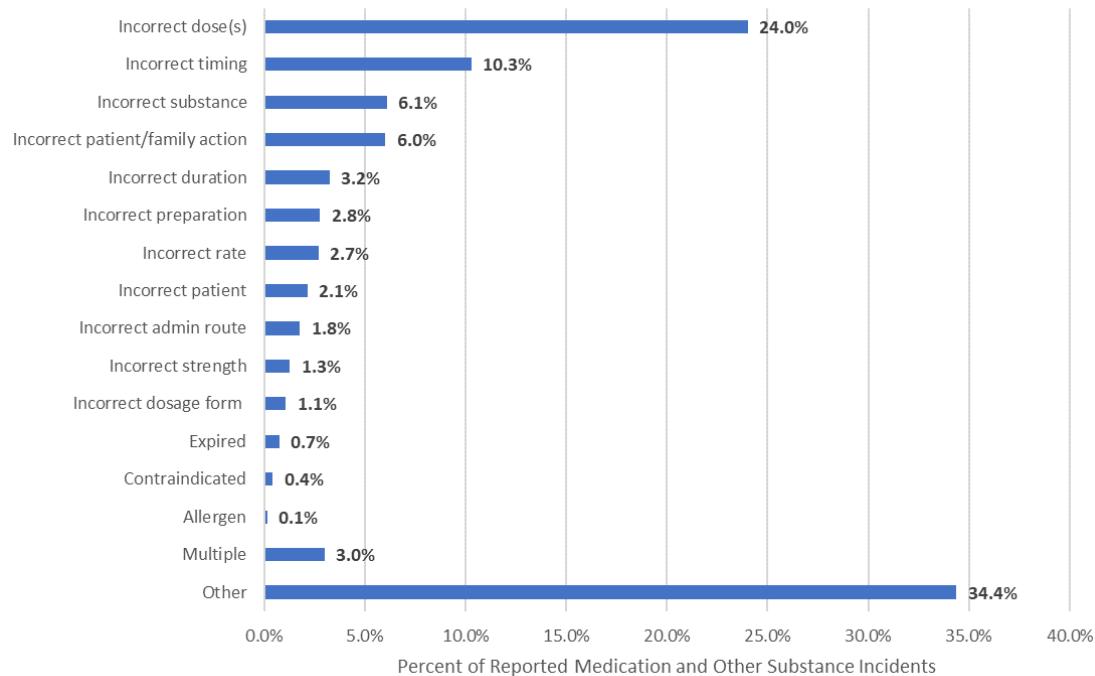
An *Incident* is a patient safety event that reached the patient, regardless of whether the event resulted in harm to the patient. Among all *Medication and Other Substance* events, *Incidents* were the most commonly reported. An overview of the process of patient care that resulted in the *Incident* may shed light on potential preventative measures and provide learning opportunities for patient safety improvement. The analyses below examine individual issues that arose during care, their impact on patients, and the degree to which such *Incidents* could have been avoided.

Important information for the analyses below is provided in the Technical Notes in Appendix B.

### Type of Incorrect Action(s)

This figure displays the type of *Incorrect action(s)* involved in *Medication or Other Substance Incidents*. *Incorrect dose(s)* was the most commonly known and specified *Incorrect Action* (24.0%; 25,736 / 107,217). The least commonly reported *Incorrect action* for *Medication or Other Substance Incidents* was *Medication/substance that is known to be an allergen to the patient* (0.1%; 144 / 107,217).

**Figure 6: Type of Incorrect Action(s) for Medication or Other Substance Incidents**

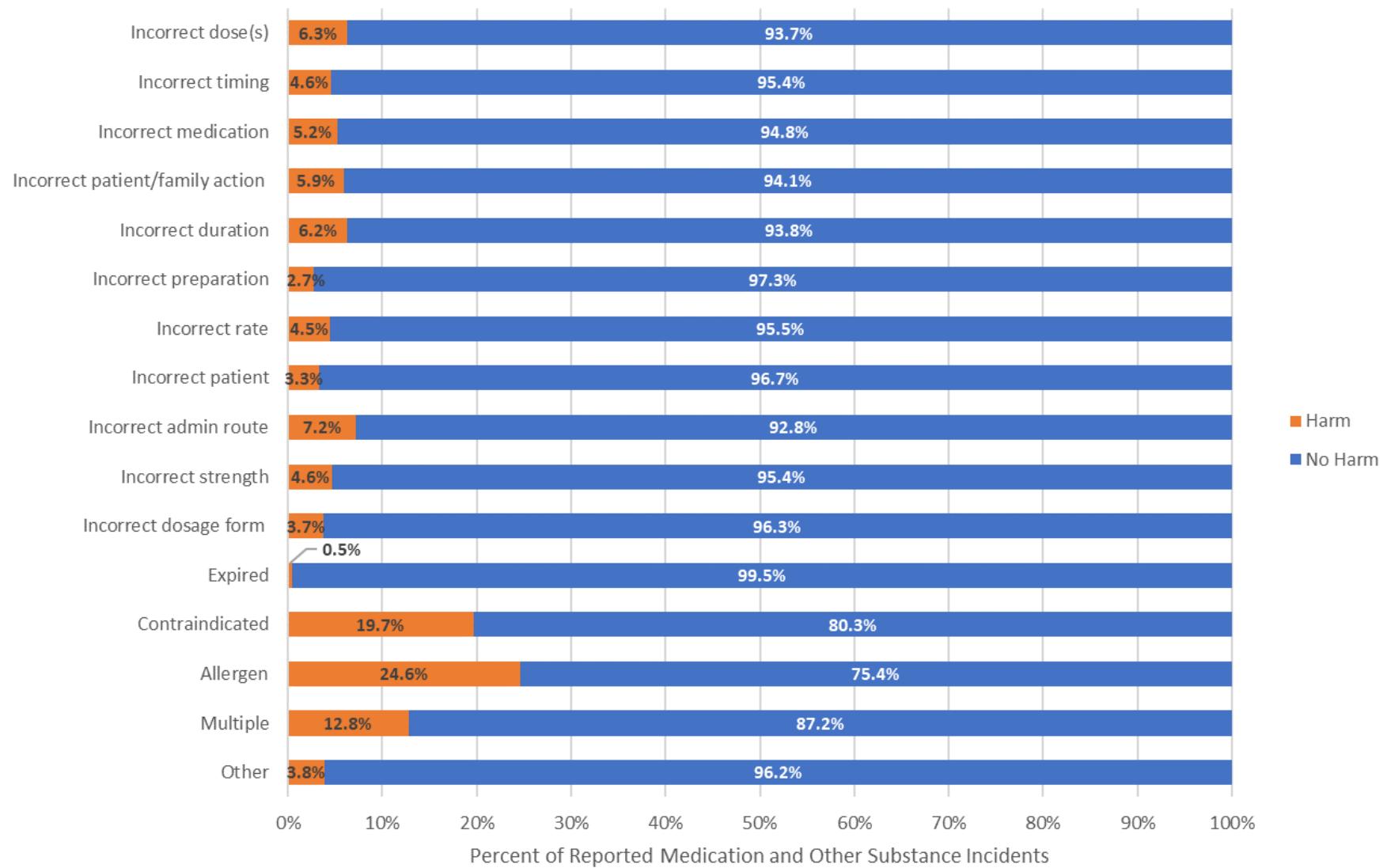


### Residual Harm Resulting from Incorrect Actions

Below, residual harm to patients resulting from *Incorrect action Medication or Other Substance Incidents* are examined. For all 61,328 reported *Medication or Other Substance Incidents* where **TYPE OF INCORRECT ACTION** and **EXTENT OF HARM** were known: 57,974 (94.5%) indicated *No Harm* to the patient, and 3,354 (5.5%) indicated *Harm* to the patient.

*Incorrect action Incidents involving a Medication/substance that is known to be an allergen to the patient resulted in the highest rate of Harm to the patient, although the counts were comparatively low compared to other Incorrect action groups (24.6%; 34 / 104). Incorrect action Incidents involving a Medication/substance that is known to be contraindicated for the patient resulted in the second highest rate of Harm to the patient (19.7%; 81 / 331). Incorrect action Incidents involving Expired or deteriorated medication/substances reported the lowest percentage of Harm to the patient (0.5%).*

**Figure 7: Extent of Residual Harm Resulting from Incorrect Action**

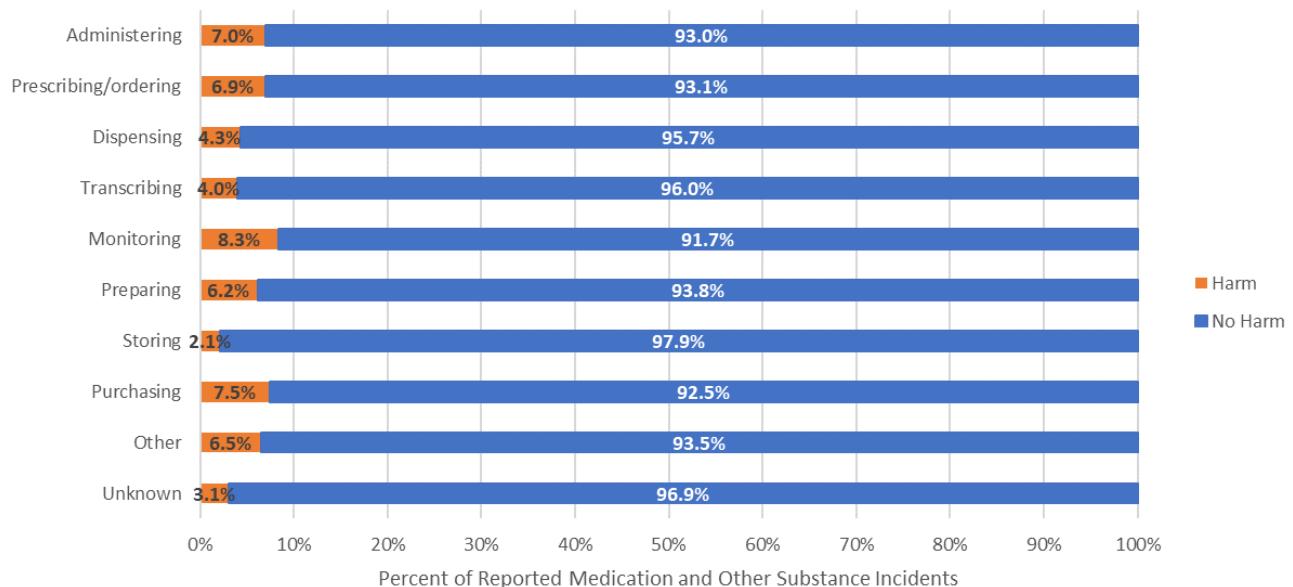


## Residual Harm for the Origin of Incorrect Action(s)

This figure presents the **EXTENT OF RESIDUAL HARM** to patients resulting from *Incidents* by the **STAGE EVENT ORIGINATED**. The impact of *Incidents* to patients were divided into two groups: *No harm* where the event reached the patient, but no harm was evident, and *Harm*, which encompasses events resulting in death, severe harm, moderate harm, and mild harm to the patient.

The *Monitoring* stage of *Incident* origin had the highest rates of *Harm* to the patient (8.3%; 191 / 2,293) compared to all other stages of event origin. *Administering* had the second highest rates of *Harm* to the patient (7.0%; 1,403 / 20,049). The *Storing* stage had the lowest rates of harm to the patient overall (2.1%; 12 / 569).

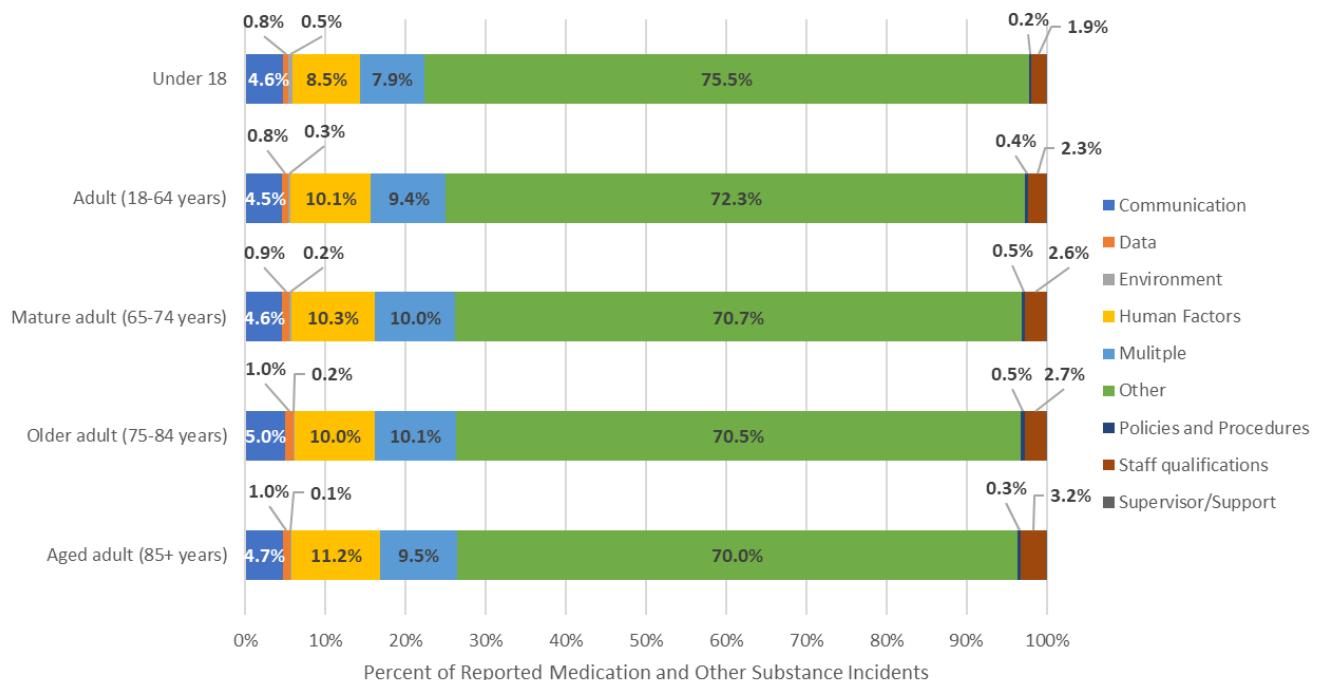
**Figure 8: Extent of Residual Harm to Patient by Stage of Medication Event Origin**



## Distribution of Contributing Factors by Patient Age

This figure displays the distribution of contributing factor(s) for *Medication or Other Substance Incidents* across patient age groups. For all 92,394 *Medication or Other Substance Incidents* where the **CONTRIBUTING FACTOR(S) FOR EVENT** was reported: 9,215 (10.0%) reported *Human Factor*, 4,345 (4.7%) reported *Communication*, and 2,249 (2.4%) reported *Staff qualifications*. Overall, patients of all age groups experienced similar rates of contributing factors for the event, suggesting a lack of disparity across patient age.

**Figure 9: Distribution of Contributing Factors by Patient Age**



### Incident Preventability by Patient Age

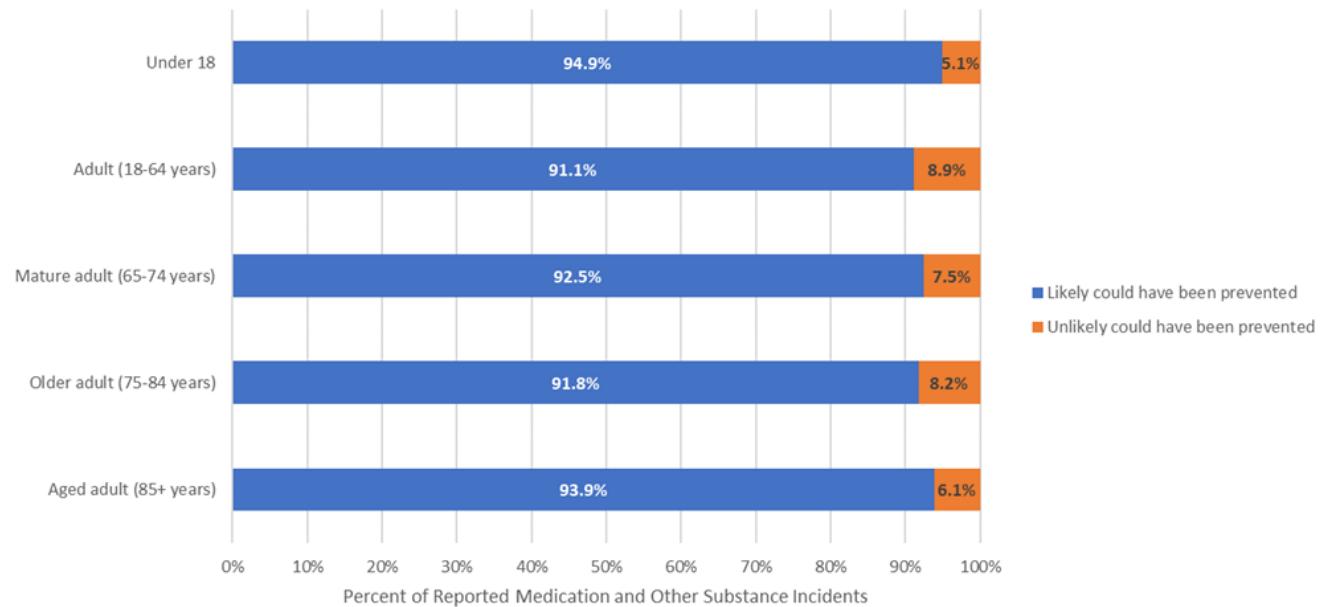
Frequently, certain intervention measures can be taken to prevent a patient safety event from occurring. Below, determinations of preventability for an *Incident* are examined across patient age groups.

For all 59,268 *Medication or Other Substance Incidents* where **INCIDENT PREVENTABILITY**

was reported and specified: 54,446 (91.9%) reported that the *Incident Likely could have been prevented* (i.e., the *Incident* could have or almost certainly could have been prevented). This suggests possible room for process improvements and general education on the use of preventative measures.

Patients *Under 18* experienced the lowest rates of unpreventable *Medication or Other Substance Incidents* (5.1%; 324 / 6,328). *Adults (18-64 years)* experienced the highest rates of unpreventable *Medication or Other Substance Incidents* (8.9%; 2,720 / 30,586). This suggests a slight disparity in **INCIDENT PREVENTABILITY** between patients *Under 18* and all other patient age groups.

**Figure 10: Incident Preventability by Patient Age**



## FOCUS: INCORRECT DOSE INCIDENTS

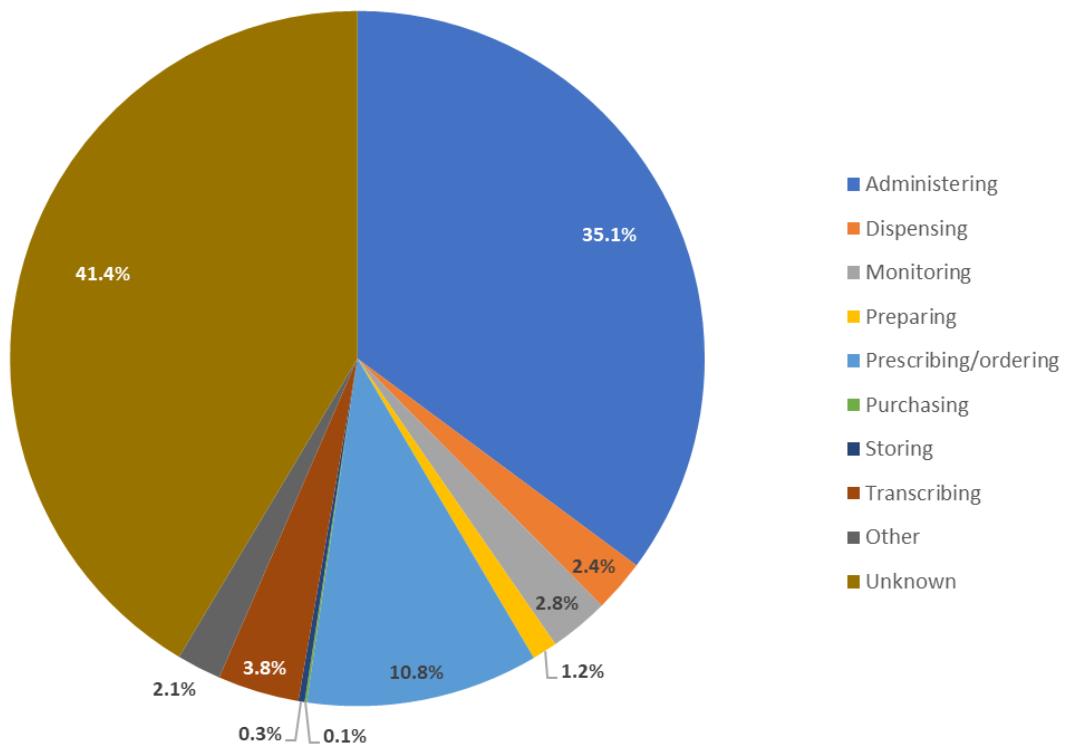
The majority of *Medication or Other Substance Incidents* are reported as *Incorrect actions*. *Incorrect dose* comprises roughly a fifth of all *Incorrect actions* and is the most commonly specified type of *Incorrect action*.

### Origin of Incorrect Dose Incidents

The originating stage of *Medication or Other Substance Incorrect Dose Incidents*, regardless of the stage at which the *Incident* was discovered, is examined below.

For all 25,539 *Medication or Other Substance Incorrect Dose Incidents* where the stage of origin was reported, 8,975 (35.1%) indicated the stage of origin to be *Administering* and 2,762 (10.8%) indicated that the originating stage was *Prescribing/Ordering*.

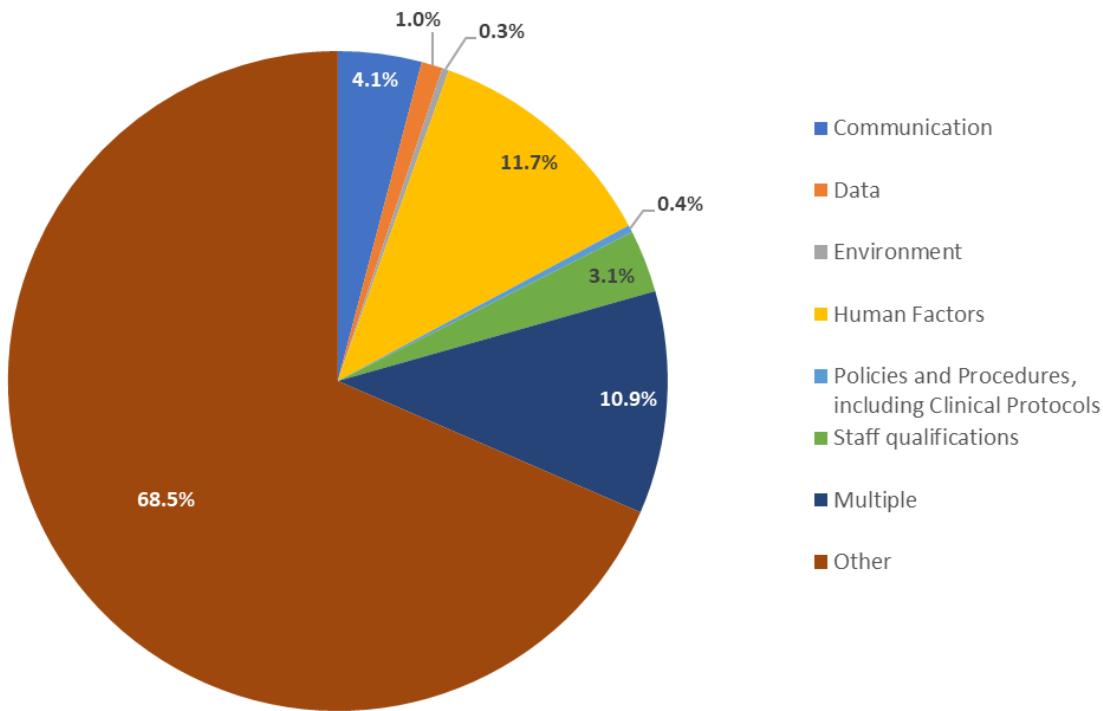
**Figure 11: : Incorrect Dose(s) Medication Incident Stage of Origin**



### Contributing Factors for Incorrect Dose Incidents

The figure below examines contributing factor(s) for *Medication or Other Substance Incidents* involving the *Incorrect action Incorrect Dose*. For all 21,345 *Medication or Other Substance Incorrect Dose Incidents* where **CONTRIBUTING FACTOR(S) FOR EVENT** was reported, 2,502 (11.7%) reported a contributing factor to be *Human Factors*, 876 (4.1%) reported *Communication*, and 657 (3.1%) reported *Staff qualifications*. *Human Factors* can include fatigue, stress, inattention, cognitive factors, and/or health issues experienced by medical staff.

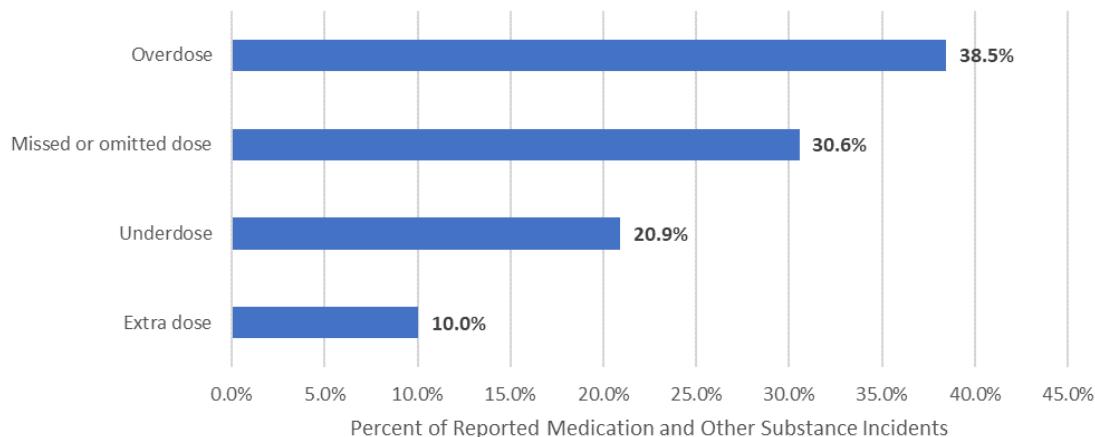
**Figure 12: Contributing Factors for Incorrect Dose Incidents**



### Description of Incorrect Dose Incidents

The distribution of *Incorrect dose* descriptions for *Medication or Other Substance Incidents* is examined below. For all 26,834 reported *Medication or Other Substance Incidents* where **DESCRIPTION OF INCORRECT DOSE** was known: 8,867 (33.0%) were described as a *Missed or omitted dose*, 8,729 (32.5%) were described as an *Overdose*, 4,897 (18.3%) were described as an *Underdose*, and 2,506 (9.3%) were described as an *Extra Dose*.

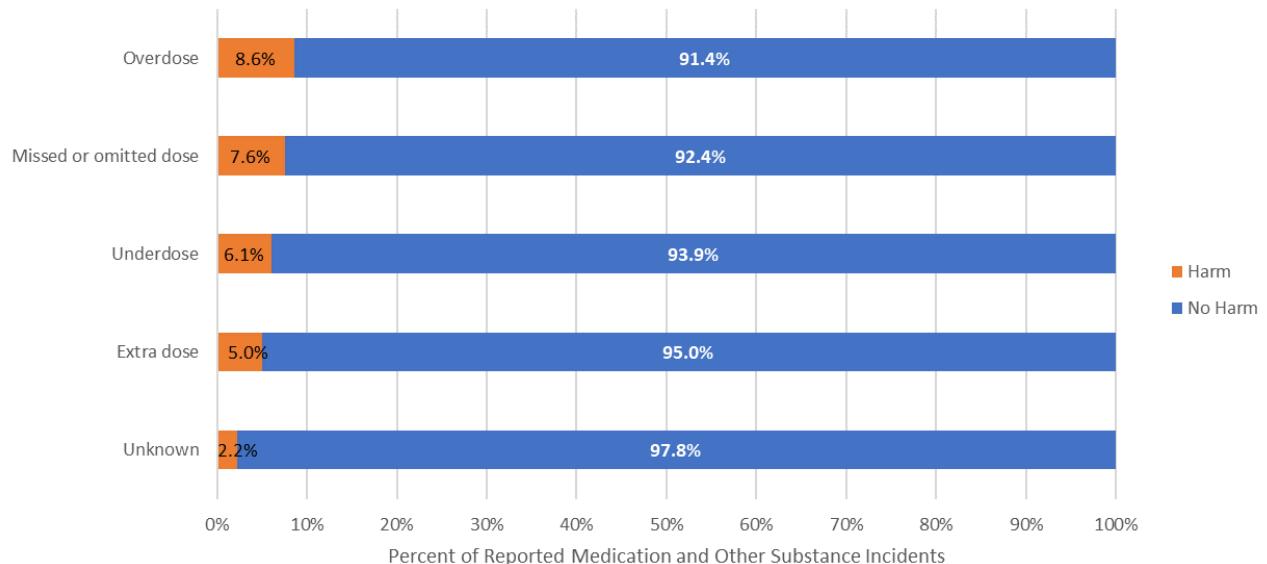
**Figure 13: Description of Incorrect Dose**



## Residual Harm for Incorrect Dose Description

Below, descriptions of the *Incorrect dose(s)* are examined for these subgroups across the outcomes of *Harm* and *No Harm*. The relative percentage of harm was highest for *Overdoses* (8.6%; 378 /4,383). Overall, all groups of *Incorrect dose(s)* share comparatively low rates of residual harm to the patient.

**Figure 14: Extent of Residual Harm to Patient for Incorrect Dose Description**



## MEDICATION OR OTHER SUBSTANCE NEAR MISSES

A patient safety event that transpired, but did not reach the patient, is considered a *Near Miss*. Recognition and understanding of *Near Misses* can provide valuable learning opportunities about how to prevent patient harm. Roughly a quarter of all *Medication and Other Substance* events reported were determined to be a *Near Miss*. In this section, we examine the distribution of *Incorrect action(s)*, as well as frequent combinations (patterns) analysis focused on the origins of the *Incorrect action(s)*.

Important information for the analyses below is provided in the Technical Notes in Appendix C.

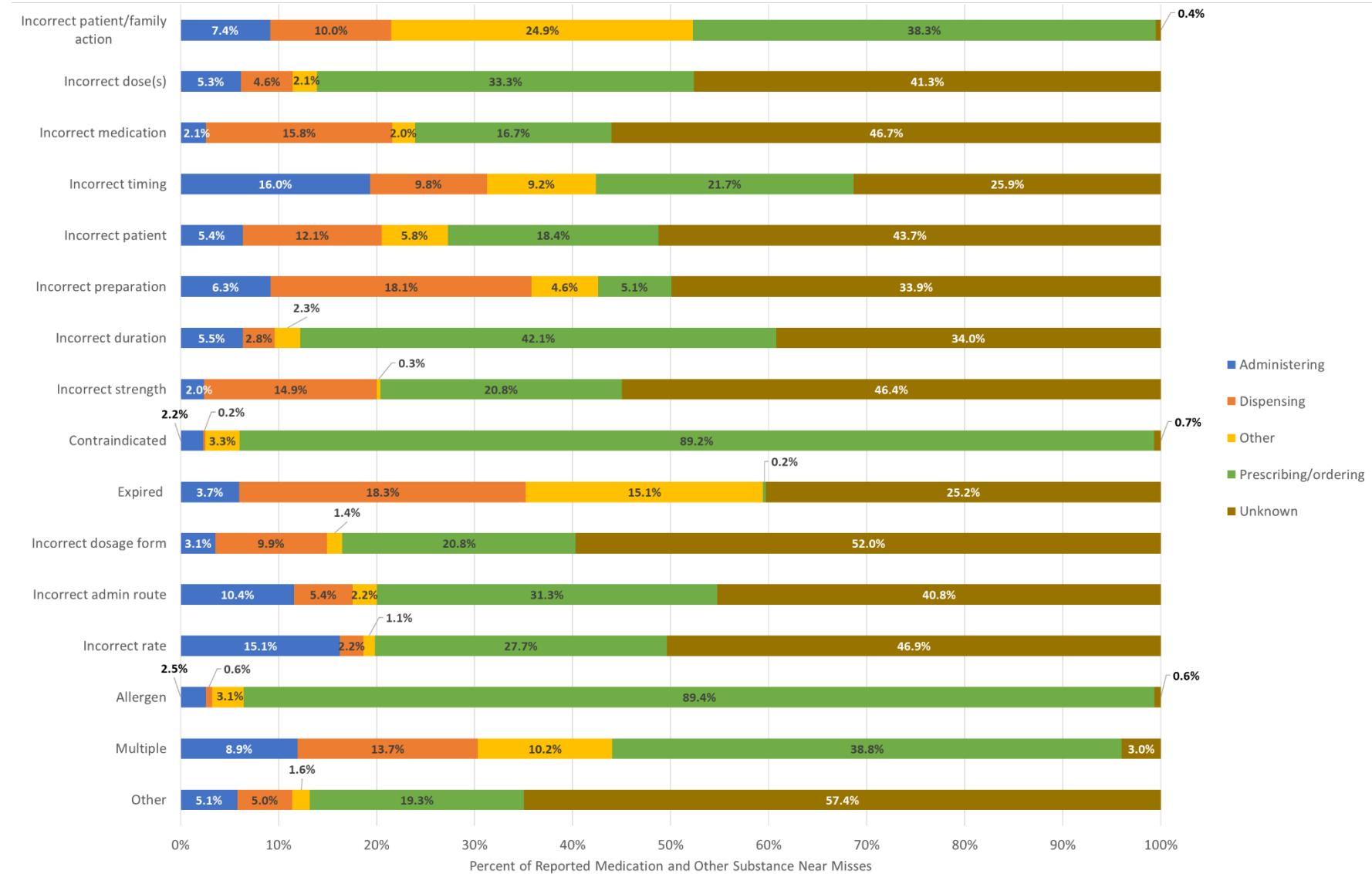
### Origin of Near Miss Incorrect Action(s)

This figure displays the distribution of originating stage for *Near Miss Incorrect actions*. Only the five most commonly reported stages of origin are displayed for brevity. For all 35,302 *Medication or Other Substance Incorrect action Near Misses* where the stage of origin was reported, 9,902 (28.0%) indicated that the stage of origin was *Prescribing/Ordering*.

*Incorrect patient/family action* (e.g., self-administration error) was the most commonly reported *Incorrect action* for *Medication or Other Substance Near Misses*. Of the 9,777 *Medication or Other Substance Near Misses* involving *Incorrect patient/family action*, 3,747 (38.3%) originated in the *Prescribing/Ordering* stage and 726 (7.4%) originated in the *Administering* stage.

Overall, *Incorrect action* groups had varying stages of origin with the most commonly reported among them being *Unknown*, *Prescribing/Ordering*, and *Other*. *Incorrect actions* involving *Allergens* and *Contraindications* displayed similar rates with the majority of events originating in the *Prescribing/Ordering* stage.

**Figure 15: Near Miss Incorrect Action Stage of Origin**

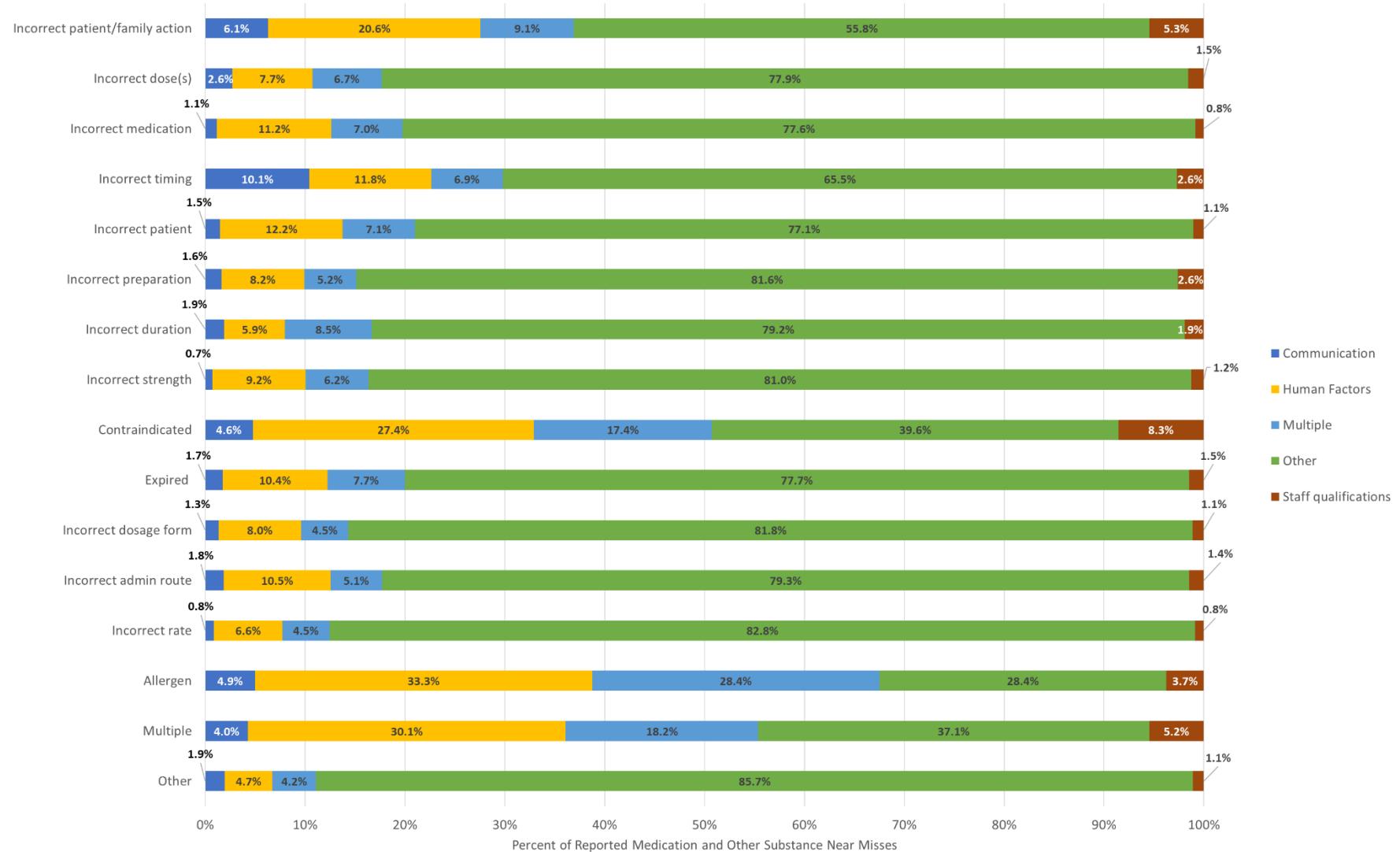


## **Contributing Factors for Near Miss Incorrect Actions**

The figure below examines contributing factors for *Incorrect actions* that resulted in *Near Misses*. Only the five most commonly reported contributing factors are displayed for brevity. For all 30,912 *Near Misses* and their corresponding *Incorrect action(s)* where the **CONTRIBUTING FACTOR(S) FOR EVENT** was reported, 3,711 (12.0%) indicated *Human Factors* as a contributing factor.

Overall, the distribution of reported contributing factors were similar across *Incorrect action* types with the exception of *Incorrect patient/family action*, *Allergens*, and *Contraindications*. For the 8,905 *Near Misses* involving *Incorrect patient/family action*: 1,832 (20.6%) reported *Human Factors* and 471 (5.3%) reported *Staff qualifications* as a contributing factor. *Staff qualifications* were most frequently reported as a contributing factor for *Near Misses* involving a *Medication/substance that is known to be contraindicated for the patient* (8.3%; 34 / 409).

**Figure 16: Contributing Factors for Near Miss Incorrect Actions**



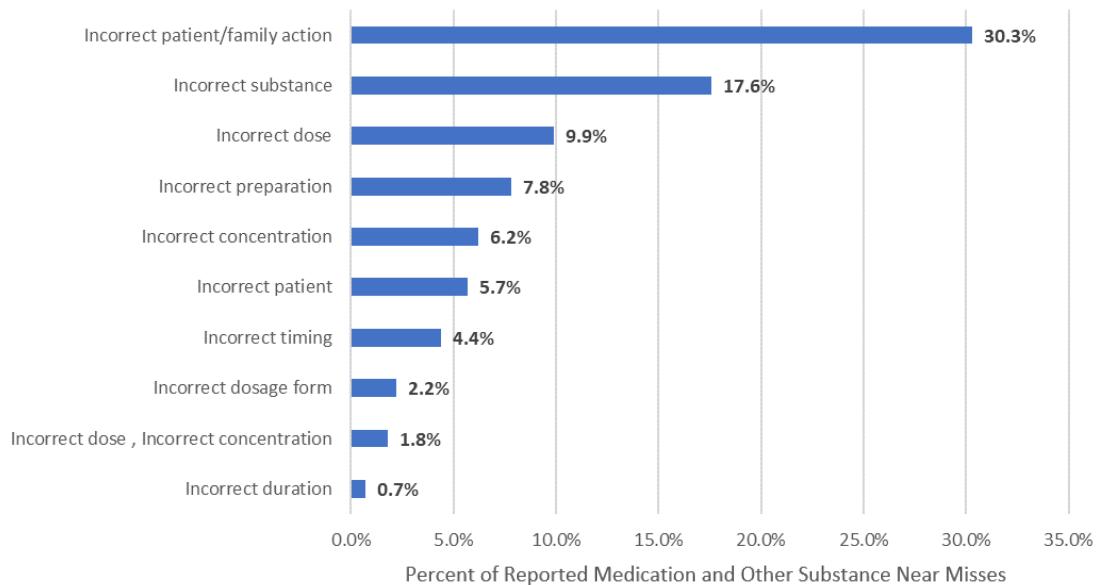
## FOCUS: FREQUENT PATTERNS OF NEAR MISSES

The patterns analyzed within this section represent a combination of *Incorrect action(s)* that were reported within a single stage of origin for the Near Miss. A patient event is only reported with one originating stage, but it can have multiple *Incorrect actions* reported which can be analyzed for various patterns. Therefore, the counts of patterns do not add up to the number of all records in the analysis. Examining frequent patterns of *Incorrect actions* can help identify healthcare improvement opportunities by pinpointing specific issues that can arise at different stages of the medications process.

### Frequent Patterns of Incorrect Actions for the Dispensing Stage

Below, the top 10 frequent combinations (patterns) of *Medication or Substance Incorrect action Near Misses* originating in the *Dispensing* stage are displayed. Multiple or combinations of *Incorrect actions* are typically reported at a lower frequency. Of the 3,290 reported *Medication or Other Substance Near Misses* originating in the *Dispensing* stage: 997 (30.3%) indicated that the *Incorrect action* was an *Incorrect patient/family action* and 60 (1.8%) indicated an *Incorrect action* of both *Incorrect dose* and *Incorrect concentration*.

**Figure 17: Frequent Patterns of Incorrect Actions for Near Misses that Originate in the Dispensing Stage**



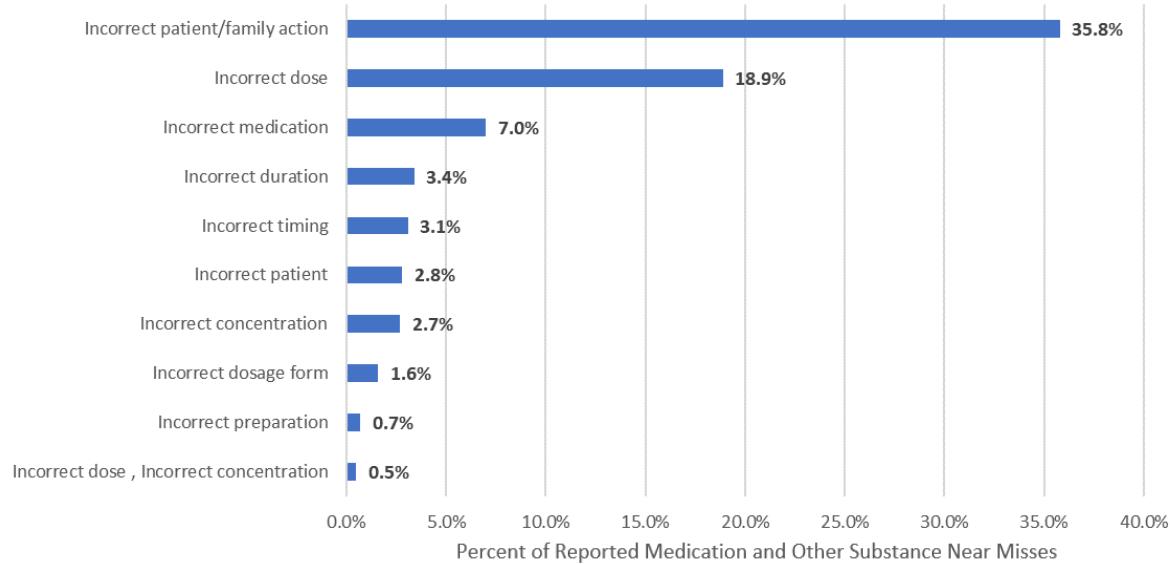
### Frequent Patterns of Incorrect Actions for the Prescribing/Ordering Stage

In this section, the top 10 frequent combinations (patterns) of *Medication or Substance Incorrect action Near Misses* originating in the *Prescribing/Ordering* stage are described. Multiple *Incorrect actions* are typically reported at a lower frequency.

Of the 10,561 reported *Medication or Other Substance Near Misses* originating in the *Prescribing/Ordering* stage: 3,781 (35.8%) indicated an *Incorrect action* of *Incorrect patient/family action* and 1,991 (18.9%) indicated an *Incorrect action* of *Incorrect dose*. One half

of one percent reported an *Incorrect action* of both *Incorrect dose* and *Incorrect concentration* (54 / 10,561).

**Figure 18: Frequent Patterns of Incorrect Actions for Near Misses that Originate in the Prescribing/Ordering Stage**



## APPENDIX A - TECHNICAL NOTES FOR ANALYSES PRESENTED IN MEDICATION OR OTHER SUBSTANCE EVENTS

- In CFER-H V1.2, **DESCRIPTION OF SUBSTANCE EVENT** in the Medication and Other Substance module is indicated by DE 288 in response to the question: “Which of the following best characterizes the event?” *Incorrect actions* include patient safety reports that are *Incidents* and *Near Misses*.
- In CFER-H V1.2, **STAGE EVENT ORIGINATED** is indicated by DE315 in response to the question: “At what stage in the process did the event originate, regardless of the stage at which it was discovered?”
- In CFER-H V1.2, **TYPE OF SUBSTANCE** is indicated by DE 270 in response to the question: “What type of medication/substance was involved?”
- **REPORT TYPE** is indicated by DE3.

## APPENDIX B - TECHNICAL NOTES FOR ANALYSES PRESENTED IN SUBSTANCE EVENT INCIDENTS

Missing responses (those that are not populated) for **TYPE OF INCORRECT ACTION**, **STAGE EVENT ORIGINATED**, **CONTRIBUTING FACTOR(S) FOR EVENT**, **DESCRIPTION OF INCORRECT DOSE**, **INCIDENT PREVENTABILITY**, and **PATIENT AGE** were excluded from analyses. Records that reported *Unknown EXTENT OF HARM*, *Unknown DESCRIPTION OF INCORRECT DOSE*, *Unknown INCIDENT PREVENTABILITY*, or *Unknown PATIENT AGE* were also excluded.

- In the CFER-H V1.2, **TYPE OF INCORRECT ACTION** is indicated by DE291 in the Medication module in response to the question “What was the incorrect action?” Appendix D lists the abbreviations shown.
- **STAGE EVENT ORIGINATED** is indicated by DE315 in response to the question: “At what stage in the process did the event originate, regardless of the stage at which it was discovered?”
- **EXTENT OF HARM** is indicated by DE55 in response to the question “After any intervention to reduce harm, what was the degree of residual harm to the patient from the incident (and subsequent intervention)?” For this figure, all Incident reports with **EXTENT OF HARM** reported are displayed as either No harm, Harm (i.e., *Mild harm*, *Moderate harm*, *Severe harm*, or *Death*), or Unknown due to small counts across the categories of *Moderate to Severe harm*.
- **CONTRIBUTING FACTOR(S) FOR EVENT** are captured in the Medication module, DE105 in response to the question: “What factor(s) contributed to the event?” Valid values for DE105 are those that are populated (non-missing).
- **PATIENT AGE** is indicated by DE45 in response to the question “At the time of the event what was the patient's age?”
- **INCIDENT PREVENTABILITY** is captured in the Medication module, DE99 in response to the question: “How preventable was the incident?”
- **INCIDENT PREVENTABILITY** response categories were collapsed into *Likely could have been prevented* (i.e., the Incident could have or almost certainly could have been prevented) and *Unlikely could not have been prevented* (i.e. the Incident could not have or almost certainly could not have been prevented). Provider does not make this determination by policy was excluded from analysis.
- **DESCRIPTION OF INCORRECT DOSE** is indicated by DE294 in the Medication

module in response to the question “Which best describes the incorrect dose(s)?” Unknown values were excluded from analysis. Valid values for DE294 are those that are populated (non-missing).

## APPENDIX C - TECHNICAL NOTES FOR ANALYSES PRESENTED IN SUBSTANCE EVENT NEAR MISSES

Missing responses (those that are not populated) for **TYPE OF INCORRECT ACTION**, **STAGE EVENT ORIGINATED**, and **CONTRIBUTING FACTOR(S) FOR EVENT** were excluded from analyses.

- In the CFER-H V1.2, **TYPE OF INCORRECT ACTION** is indicated by DE291 in the Medication module in response to the question “What was the incorrect action?” Appendix D lists the abbreviations shown.
- **STAGE EVENT ORIGINATED** is indicated by DE315 in the Medication module in response to the question “At what stage in the process did the event originate, regardless of the stage at which it was discovered?”
- **INCIDENT PREVENTABILITY** is captured in the Medication module by DE99 in response to the question: “How preventable was the incident?”

## APPENDIX D - ABBREVIATED RESPONSE CATEGORIES FOR DE291 (WHAT WAS THE INCORRECT ACTION?)

Answer values listed below include only those changed within the report text.

Original answer values from CFER H - V1.2	How these answers are labeled in figures and text of this report
Medication/substance that is known to be an allergen to the patient	Allergen
Incorrect dosage form (e.g., sustained release instead of immediate release)	Incorrect dosage form
Medication/substance that is known to be contraindicated for the patient	Contraindicated
Incorrect patient/family action (e.g., self-administration error)	Incorrect patient/family action
Incorrect medication/substance	Incorrect medication
Incorrect route of administration	Incorrect admin route
Incorrect duration of administration or course of therapy	Incorrect duration
Incorrect preparation, including inappropriate cutting of tablets, error in compounding, mixing, etc.	Incorrect preparation
Expired or deteriorated medication/substance	Expired
Other: Please specify	Other



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