Underreporting of Patient Safety Incidents Reduces Health Care’s Ability to Quantify and Accurately Measure Harm Reduction

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Abstract: Underreporting of patient safety incidents creates a reservoir of information that is plagued with epidemiological bias. These include systematic biases such as the practice of reporting minor incidents at the expense of more serious ones. This leads to inaccurate rates of errors and an inability to generalize results to whole patient populations. It leaves reporting incidents, in epidemiological terms, comparable to nonrandom samples from an unknown universe of events.

The epidemiological problems lead to a situation where priorities are skewed toward what “we know we know.” As “we know what we do not know,” for example, gaps in knowledge about serious incidents due to low reporting rates, due caution must be applied in making policy based on biased underreporting.

Barriers to reporting contribute to low participation rates and further bias information. Lack of feedback and fear of personal consequences are common barriers.

Evaluation of reporting systems indicates reports can be used as tools for learning, but it is not yet possible to monitor improvement in patient safety or measurably prove reduction in harm. Mandatory reporting is sometimes used as a learning tool, but it is not yet possible to monitor improvement in care systems: the Reporting Paradox. As systems develop, professionals become more comfortable with reporting, and the trend to omitting serious incidents, in epidemiological terms, severely constrains monitoring trends and progress in patient safety. Instead, these data play an important role in identifying hazards to future patients. Underreporting make the latter 2 less likely.

Common barriers leading to underreporting are classified in 2 ways in Figure 1. First, according to Donebadian structure, process, and outcome model of health care; second, by considering the attitudes and fears of individual professionals. Lack of feedback to the reporter and fear associated with reporting are common themes.

An anonymous survey of approximately 800 health care professionals highlighted that lack of feedback to the reporter was among the most significant barrier to reporting. Approximately 60% of physicians and nurses felt this to be the case. Failing to feedback to the reporter demoralizes their efforts and, coupled with lack of support and fear of reprisal, decreases their likelihood of reporting again. A voluntary questionnaire study of 315 health care professionals revealed that reporting was most common to a colleague. Involving senior colleagues was not routine, more so for physicians than nurses.

**EPIDEMIOLOGICAL PROBLEMS**

In addition to individual barriers, incident reporting has been plagued by epidemiological problems in 3 principal areas (Table 1). Paradoxically, establishing a reporting system creates a false impression of increasing levels of error within health care systems: the Reporting Paradox. As systems develop, professionals become more comfortable with reporting, and the systems are used more frequently. Error rates stay the same but are observed more frequently (Fig. 2). This has significant ramifications especially when such information is used by the media.

Second, underreporting of incidents and preference for incident type affects the generalizability of cumulative information. With at least half of all incidents going unreported, and a trend to omitting serious incidents, samples of reports are systematically biased.

Third, reporting is heavily skewed toward nursing professionals leading to a participation bias. This not only affects the generalizability of samples to the whole patient populations, but also leads to incident reporting being perceived as owned by nursing professionals.

**Participation Bias**

Physicians are poor reporters of incidents. In a review of 5 health care centers in California, only 1.7% of reports were
A survey of 120 physicians at the University of Virginia Hospital revealed that despite 65% having made no reports, 60% had observed 3 adverse events (or near misses) or more. A similar finding was reported by the Australian Incident Monitoring System—physicians contributed 2% of reports versus nurses who submitted 88% of reports.

In a descriptive study of 92,547 adverse events and near misses, representing 26 hospitals across the United States, there was a vast variation in reporting rates (9–95 reports per 1000 inpatient days), indicating underreporting in many sites. Physicians were identified as particularly poor reporters supplying 1.4% of reports. By contrast, nurses submitted 47% of reports.

Low physician reporting is problematic because it hinders health care’s ability to identify and mitigate risks. Each type of physician views health care through a unique lens, which allows them to identify certain types of hazards and certain contributing factors better than others. For example, an oncologist may be more likely to identify risks and errors in the process of care for radiotherapy. As such, lack of reporting hinders patient safety improvement efforts. It also has consequences for patients. A recent review of orthopedic implants suggested that underreporting of adverse events led to a delay in product recall and increased revision operations.

INCORRECT PRIORITIZATION

Participation bias misdirects prioritization of solution development. Predominantly determining the frequency of error from reports from nurses creates an impression that certain errors are more of a problem than others. Until reports from all health care professionals are equally weighted, the possibility of using information to prove error reduction is not possible. This is particularly significant in the area of diagnostic errors (almost universally the role of a physician), especially as diagnostic errors are estimated to account for an unknown but likely high number of errors.

Falls in hospital are frequently and consistently reported by nurses, whereas other more serious events go unreported. Falls accounted for 32.3% of all patient safety incident reports in the United Kingdom’s National Patient Safety Agencies’ National Reporting and Learning System between September 2005 and August 2006. The United Kingdom’s National Health Service has also suffered participation bias. It is countercultural for nurses not to fill in incident reports for falls out of bed; yet, physicians routinely fail to report serious untoward incidents.

Understanding the culture change that led to nurses filling in incident reports on falls out of bed is a mystery in British health care. It has been suggested that these incidents are frequently reported as there is no fear of personal consequences as the incidents are not felt to be due to individual mistakes.

There is a risk that if certain areas of reporting are disproportionately reported compared with other areas that these become routine and cease to be taken seriously. Yet, despite this, with increasing reporting rates, safety culture has improved.

EVALUATING ERROR REDUCTION

At least 8 countries have national reporting systems. Yet, few systems have been subjected to rigorous evaluation. Although ease of use is regularly reviewed, reduction of unsafe outcomes is rarely proved—confounded by the inherent bias present in most data sources. A recent review of the National

FIGURE 1. Barriers to incident reporting.

TABLE 1. Underreporting Confounds an Epidemiological Approach to Reporting Systems

<table>
<thead>
<tr>
<th>Epidemiological Weaknesses of Reporting Systems</th>
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<tr>
<td><strong>The Reporting Paradox</strong></td>
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<td>Underreporting leading to systematic bias:</td>
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<tr>
<td>1. Of all incidents</td>
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<td>2. Of incident type</td>
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<td>Lack of generalizability to whole patient populations</td>
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<td>Participation bias</td>
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Although voluntary systems have been favored by health care professionals, mandatory systems offer certain advantages to government (and perhaps the public) in provider accountability, including statutory responsibility, independent inquiry, mandated change, bringing information into the public domain, and having a mechanism to take legal action to enforce change.24

CONCLUSIONS

Underreporting is a significant problem in realizing the epidemiological potential of incident reporting in health care internationally. Systems are too complex and too numerous to yield accurate cumulative information about patient safety and suffer systematic bias that confounds proving a reduction in error.

Future challenges include taking a public health approach to reporting system design and analysis, improving physician reporting rates, reducing bureaucracy allowing translatability across geographical lines, and determining the extent to which different models of reporting (such as mandatory reporting) will allow accurate benchmarking of levels of harm and facilitate measurable improvement in safety.

Those managing incident reporting systems need to better understand, reduce, and make transparent biases in reporting and to create a situation whereby progress can be benchmarked and measured. Mandatory reporting of well-defined reportable events may be 1 step to achieving this goal. In addition, if systems are simple to use, easy to understand, and have built-in user feedback, success is more likely. Lack of uniformity across reporting systems locally, regionally, nationally, and internationally is a major system weakness and may also contribute to underreporting, although this is hard to prove.

The problem of unsafe care and the need for fully functioning reporting systems is well understood, and it is undisputed that reporting systems should be a cornerstone of overall patient safety system reform. Yet, so far, underreporting is common place, physicians fail to be fully engaged and multiple biases prevent monitoring of progress.

REFERENCES


