SUBJECT: **ACES Incident Handling** NUMBER: **III-40**

DATE: June 2016

APPROVED BY:

Purpose

The purpose of this policy is to articulate the ACES team's approach to handling both routine and exceptional incidents that may occur in the day-to-day operation of ACES. This policy establishes what constitutes an incident, what protocol will be followed in the event of an incident, and the documentation requirements.

Procedures

Definition of Incidents

'Incidents' as used for the purposes of this policy is meant to be generic, and may include but are not limited to the following:

1. system failure (hardware, software, power)
2. data feed transmission error
3. data quality
4. policy change
5. audit review
6. system maintenance (planned)
7. breach
8. account maintenance
9. other (user defined)

Information Captured

Data captured may vary by incident type. Where feasible, data will include:

1. date, time, and time zone of the incident
2. incident 'title'
3. incident type (see above)
4. severity/critical rating (low/medium/high)
5. originator's name
6. lead staff member assigned to
7. resolution actions, work performed
8. outage/downtime
9. implications, side effects, if any
10. resolution / incident closure date and time

All incidents are to be captured in the KM Informatics Register.

1.1. ACES Data Maintenance and Remediation Process

Transmission errors are exceedingly rare; these kinds of 'garbled' HL7 messages will fail upon insertion into the database. Experience also shows that systematic errors (such as the EMS arrival flag being stuck on TRUE) are rare. More common—but still the exception rather than the norm—are data entry errors on the part of triage staff.

1.1.1. Principles

1. We do not discard entire records should a field (e.g., age, gender) be invalid. The visit, even those containing errors, still represent a valuable epidemiological signal. For example, a hospital may admit a patient but fail to record a chief complaint or reason for admission. Though
   ACES cannot use this record to detect particular kinds of public health threats, the record of admission itself is still a valid epidemiological and volumetric indicator.
2. Section six of the ACES DSA states our policy on data quality; that while we endeavour to detect and remedy systematic errors on a best efforts basis, we make no explicit warranty on data quality.
3. Recognizing that a key value proposition to our hospital partners is that ACES requires a minimal on-going investment of staff time after the initial data interface deployment, we need to be aware of requests that we make of our hospital partners that require extra, uncompensated effort on their part.

1.1.2. Identification

When, in the normal course of our syndromic surveillance analyses, we detect errors that appear to be systematic in nature, those errors will be reported to the Project Director (or his/her designate). The Project Director (or his/her designate) will review the ED visit history for that hospital to determine if the errors are, in fact, systematic and representative of a larger problem or if they are isolated one-off errors.
Under development are more routine data integrity checks to automate the detection of more easily detected systematic errors. Some examples may include:

1. That the proportion of visits with NULL values for a particular field exceeds the historical baseline by some threshold. For example, history tells us that at Hospital X, which receives 300 visits per day on average, that no more than 30 visits (i.e., 10%) will have a NULL chief complaint. An automated routine can easily detect when more than 60 visits (i.e., 20% or double) have a NULL chief complaint.
2. Similar to one (1) above, automated routines can be implemented to detect an unusual distribution of values for a nominal or continuous field. For example, gender is overwhelmingly coded as 'M', 'F' while 'U', NULL, [empty string], 'H', and 'N' are

encountered at the rate of 7.5 records per 100,000. If the error rate becomes, say, 75 per 100,000 admissions (which is a ten-fold increase) then we would investigate further.

3. Automated routines could easily detect when the admission timestamp of, say, 10 patients are the same for a given hospital (i.e., no single emergency department formally admits more than one, maybe two, patients at a given point in time and that usually only occurs in larger EDs that have more than one triage desk).
4. A number of variations on the above scenarios could, to some extent, assist in the detection of what could be systematic errors.
5. History shows that, for various reasons, same hospitals send the same records more than once. Routines are in place to identify and purge the duplicates (using our "duplicate killer").

1.1.3. Remedies

We do not pursue remediation for obvious data entry errors (e.g., a non-valid gender, an invalid postal code, a missing CTAS score, or for any errors in the chief complaint/reason for admission). These are errors that clearly stem from triage data entry.
Two kinds of systematic errors will be reported to hospital partners:

1. Those that have been detected and are continuing. For example, if we see evidence that for the last two days that every acuity score is constant at CTAS 1 (life saving resuscitation required) then we would notify our hospital partner of same.
2. If, retrospectively, the Project Director determines that an error (that has since been corrected) continued for so long that it has significant epidemiological implications, then we would seek to remedy that error with our hospital partner.

1.1.4. Process

Identified errors will be informally discussed with the Project Director (or his/her designate) who may request and suggest further methods to confirm the presence of a systematic error. If a systematic error is discovered, it will be documented in the Register and the Project Director will indicate in the register if remedy is to be sought or not.

1.1.5. Disposition

Four outcomes are possible:

1. A systematic error condition has been identified and the Project Director has determined that remediation/correction should not be pursued; that is, that the epidemiological implications are insufficient to warrant contact with the hospital (see Principles above).

2. A systematic error has been identified and reported to our hospital partner. Our hospital partner will investigate the error and, if so found, will correct the error for data sent henceforth but may elect not to send historical, corrected data.
3. A systematic error has been identified and reported to our hospital partner. Our hospital partner will investigate the error and, if so found, will correct the error for data sent henceforth. Depending on how easy it is for them, they may have the resources to do a custom historical extract for us with corrected data.
4. A final outcome is that a few of our hospital partners simply lack the resources to be able to investigate, fix, or correct errors brought to their attention. This outcome recognizes the presence of an error in ACES that cannot be remedied with the hospital. In these cases, the time span and particulars of the errors will be recorded in the Register or the Project Director may elect to remove these data and subsequent epidemiological analyses will need to account for them.

In all cases, the disposition will be captured in the Register.

1.2. Record Retention

ACES data (i.e., inpatient admission and ED registration records) are retained indefinitely when the relevant DSA between parties remains in effect. As required in 10.5 of the DSA, these data are irrevocably deleted upon termination of the DSA. As of this writing, a DSA has never been terminated. Data from the original partner hospitals extend back to 2001 and as new acute care partners join the project, they are asked—per 5.3 of the DSA—to submit historical data that would assist in the creation of epidemiological baselines. Data are retained indefinitely so that ACES can be improved by learning from history (e.g., retrospectively testing a new alerting algorithm) or studying longer-term epidemiological trends. All data are stored digitally; there are no hardcopies of admission and registration records.