



Surveillance Evaluation of Death, Illness, and Injury Reports from Licensed Public Pools and Water Attractions – Wisconsin, 2008-2014

Attractions – Wisconsin, 2008-2014

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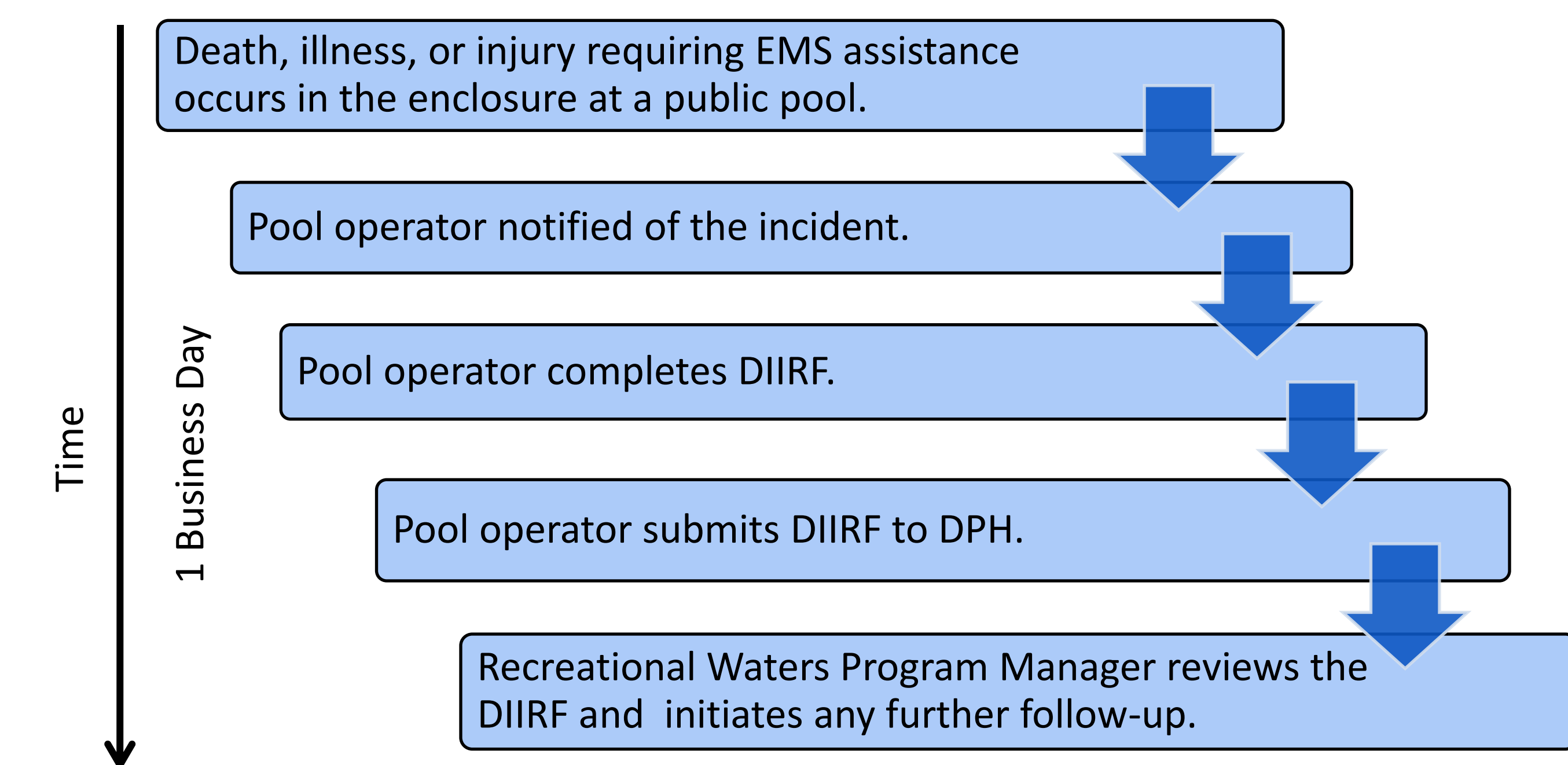
BACKGROUND

In the United States, public pool use is an important recreational activity. In the United States, swimming is the fourth most popular recreational activity¹ and has many health benefits contributing to its popularity. However, swimming can pose a health risk, especially in younger populations. Drowning is the leading and second leading cause of death due to unintentional injury in children aged 1-4 and 5-9 years respectively.²

Wisconsin is home to thousands of licensed pools and water attractions. Per Wis. Admin. Code § DHS 172.32(2), licensed recreational public pool operators are required to report all deaths, and any illness or injury (DII) that occurs within the pool enclosure requiring emergency medical service (EMS). Incidents should be reported to the Wisconsin Division of Public Health (DPH) by phone or fax by the next business day. A separate DII report form (DIIRF) is required for each individual involved in the DII incident. The Recreational Waters Program Manager reviews all reports and initiates follow-up if the event is a drowning or near drowning event. Figure 1 demonstrates the flow of information.

Since implementation in 2008, the DII reporting system in Wisconsin has not been evaluated or updated. DII reporting requirements vary between states and effective systems are vital when evaluating statutes intended to ensure the safety of recreational pools.

Figure 1. Current DII system information workflow with required timeline.



OBJECTIVES

- Assess DPH's ability to detect DII incidents at licensed public pools and water attractions based on DHS 172.3(2) reporting requirements.
- Evaluate the system's data collection form and data field types.
- Assess the ability to evaluate risk factors associated with reported DII events and revise statutes to reduce risk.
- Provide recommendations for improving the DII reporting system.

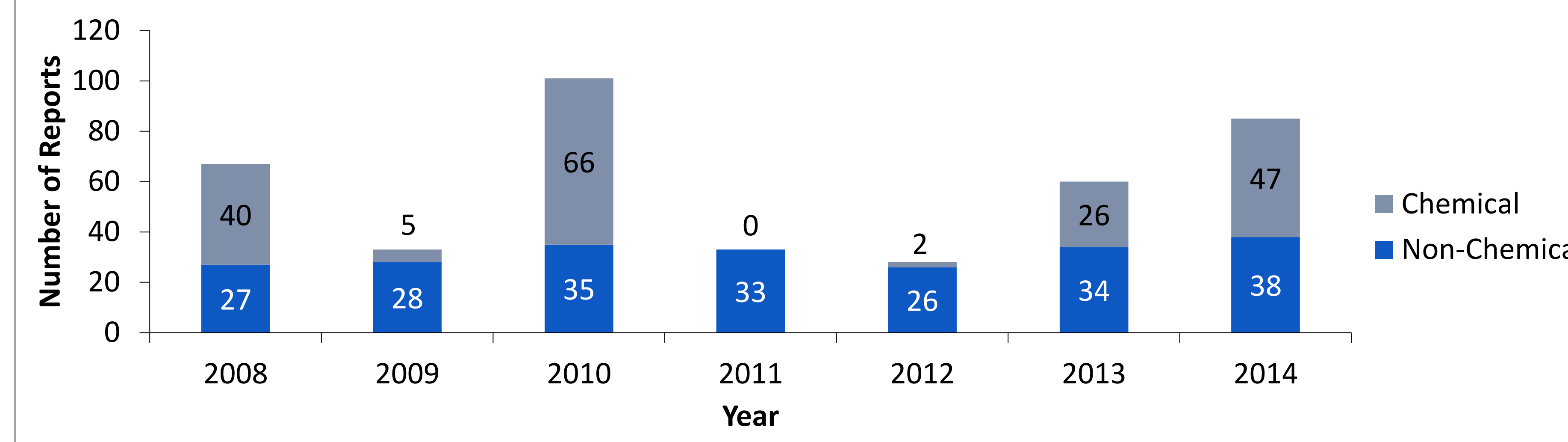
METHODS

- DIIRFs submitted during 2008-2014 were collected and entered into an electronic database.
- The DII Recreational Waters Program Manager was interviewed and asked to describe program goals, performance, and challenges.
- Wisconsin's EMS database was queried for unreported DII events to calculate sensitivity.
- Using the CDC Updated Guidelines for Evaluating Public Health Surveillance Systems,³ system simplicity, flexibility, acceptability, timeliness, sensitivity, data quality, stability, Predictive Value Positive (PVP), representativeness, and usefulness were evaluated.
- A DII event was defined as a single DIIRF for non-chemical release events, or multiple DIIRF related to a single chemical release. Sensitivity, PVP, and timeliness were assessed using the total number of DII events reported.
- The total number of active pool licenses in 2015 was obtained and a total number of licensed facilities with unique addresses was determined (some possessing multiple licenses). The number of facilities had to be estimated for three local health departments that do not use the statewide license system.

RESULTS

During 2008-2014, 407 DIIRF associated with 231 distinct events were received by DPH (Figure 2). Of those 231 events, 10 chemical exposures accounted for 186 individual DIIRFs.

Figure 2. Number of DIIRF by Year and Event Type, 2008-2014 (n=407)



+ Good system flexibility and simplicity.

+ Good stability within the reporting system.

+ Good system support with dedicated staffing and funding.

+/- Fair to good yearly PVP.

- Overall PVP was 78% with yearly PVP ranging from 55%-87%.
- DII events were reported even though EMS was not called to assist as well as when the event happened outside the pool enclosure, excluding them as reportable events.

+/- Fair timeliness of DIIRF submission after DII event.

- Of DII events where time between the incident and reporting could be determined (n=202), 52% were received within the next business day.
- For those DIIRF received after the next business day requirement, the median number of business days between the DII event and DIIRF submission was six business days (Range: 2-266 business days).
- There is no standard system for tracking when DIIRF are received by DPH.
- Timeliness measures for other steps in the DII reporting system, i.e., time between DIIRF submission and follow-up by DPH, could not be evaluated due to a lack of data collection.

Figure 3. DII Sensitivity by Year, 2011-2014

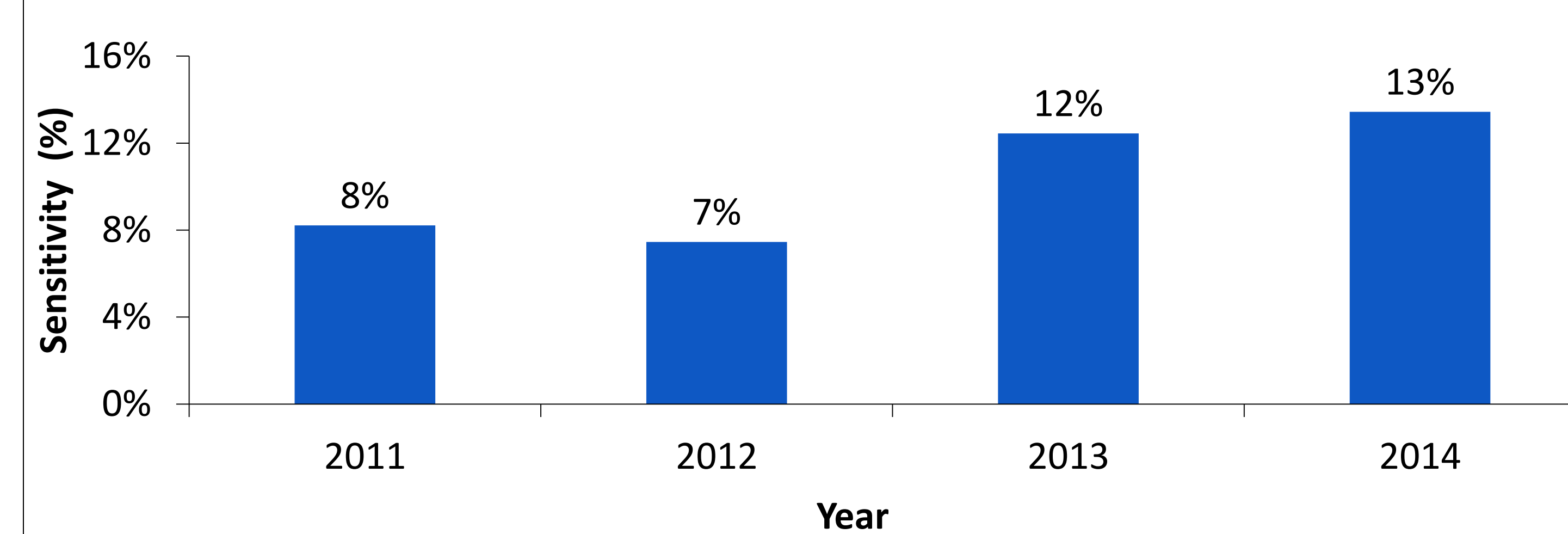
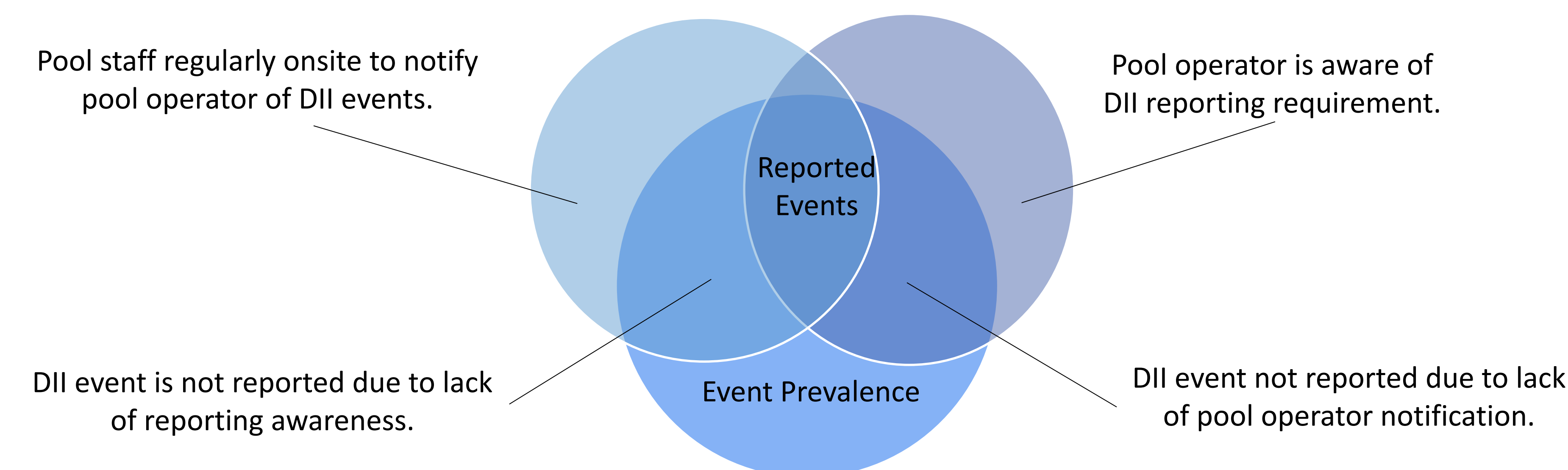


Figure 4. Effect of Pool Operator Notification and Reporting Awareness on DII Reporting



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RESULTS

Poor sensitivity based on EMS database reports

- 1,295 DII events were identified in the EMS database that were not reported through the DII system.
- Yearly sensitivity could only be calculated for 2011-2014, because the EMS database became widely adopted by EMS operators in 2011 (Figure 3).
- Pool operators need to be notified a DII event happened and aware of the reporting requirement in order for a report to be submitted (Figure 4).

Poor data collection form and method impedes meaningful analysis.

- Information regarding contributing factors to DII events needed to evaluate risk are not systematically collected.
- The majority of the questions on the DIIRF are open-ended and do not allow for quantitative analysis.
- Prior to evaluation, DIIRF data was not entered into a database, preventing analysis.
- Based on current DIIRF data fields, it cannot be regularly determine if reported events meet the case definition.

Poor geographical representativeness and acceptance.

- No single database currently tracks the annual number of pool licenses for each county in Wisconsin, therefore the annual DII rates per county could not be calculated. For this evaluation, only pool licenses per county for the year 2015 were available.
- Only 109 (5%) of the estimated 2,400 licensed public pool and water attraction facilities in the state submitted a DIIRF during the evaluation period.
- Facilities in less than half of Wisconsin counties submitted a DIIRF during the evaluation period even though all but one county has multiple licensed public pools, based on the number of 2015 licenses (Figures 5 and 6).

Figure 5. Distribution of Active Public Pools Licenses, by County, 2015 (n=4,162)

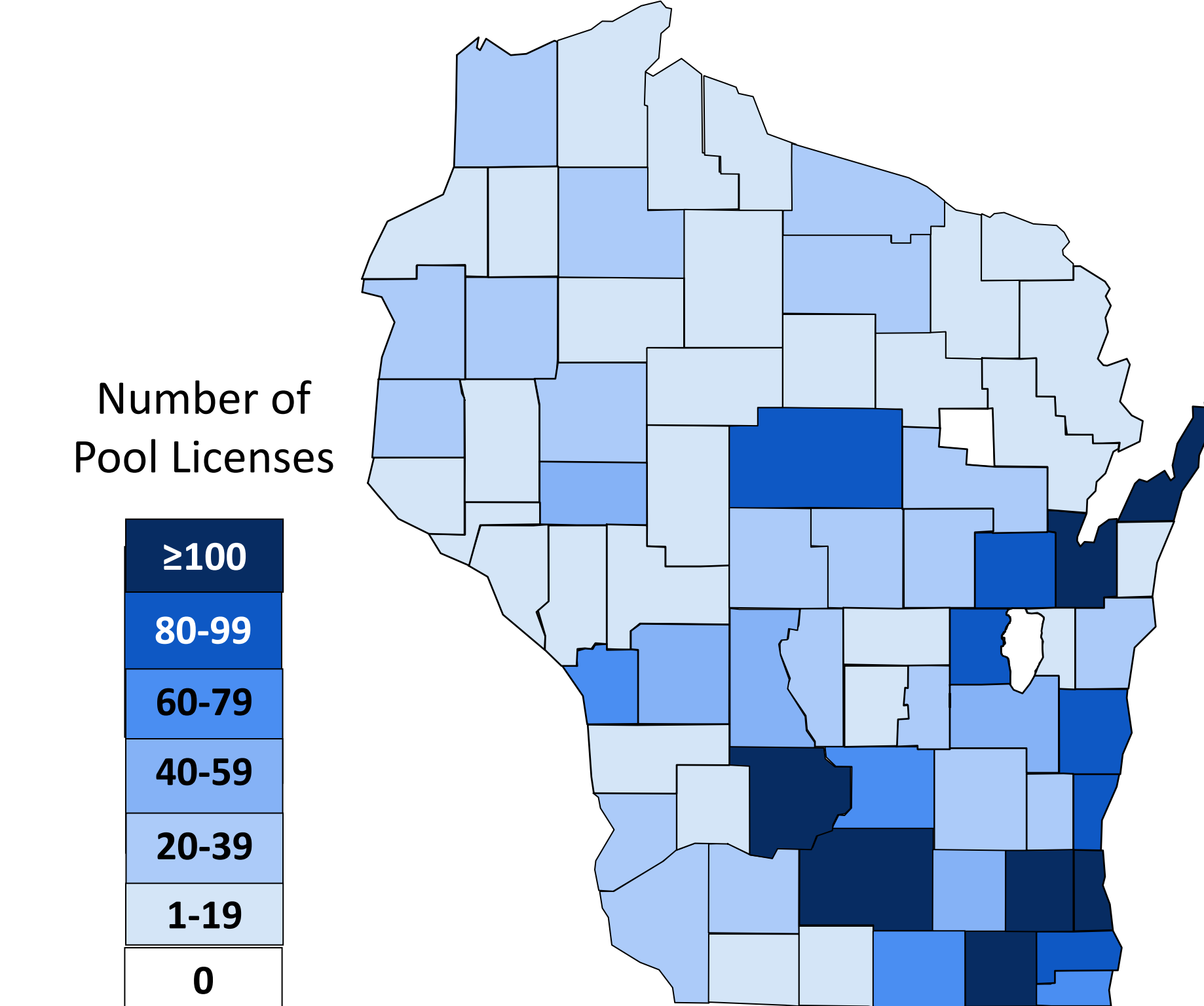
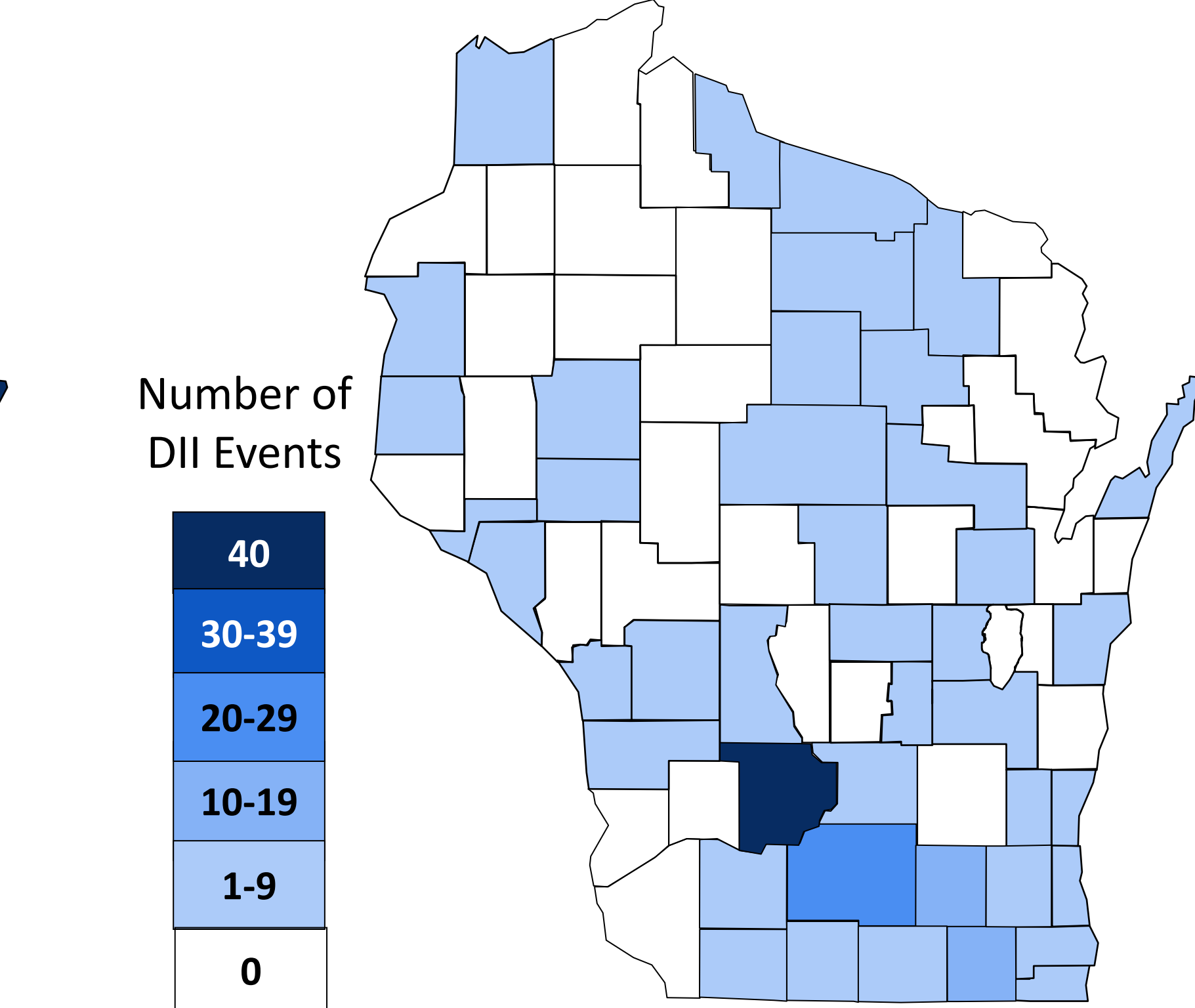


Figure 6. Distribution of Reported DII Events, by County of Reporting Facility, 2008-2014 (n=231)



RECOMMENDATIONS

Under-reporting and poor data quality are the main weaknesses with the system. Suggested improvements include:

- Develop a secure online form that will allow for automatic database population and data quality assurance.
- Develop guidance documents for pool operators on how and when to complete the DIIRF.
- Revise DIIRF questions to allow for risk analysis of contributing factors and revise state statutes based on results.
- Add a "State Use Only" section on the DIIRF for tracking of DIIRF receipt and follow-up.
- Link DII system with EMS database and target pool operator education to improve underreporting.

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