Maternal Mortality and Morbidity Review

New Mexico Legislative Health and Human Services Committee

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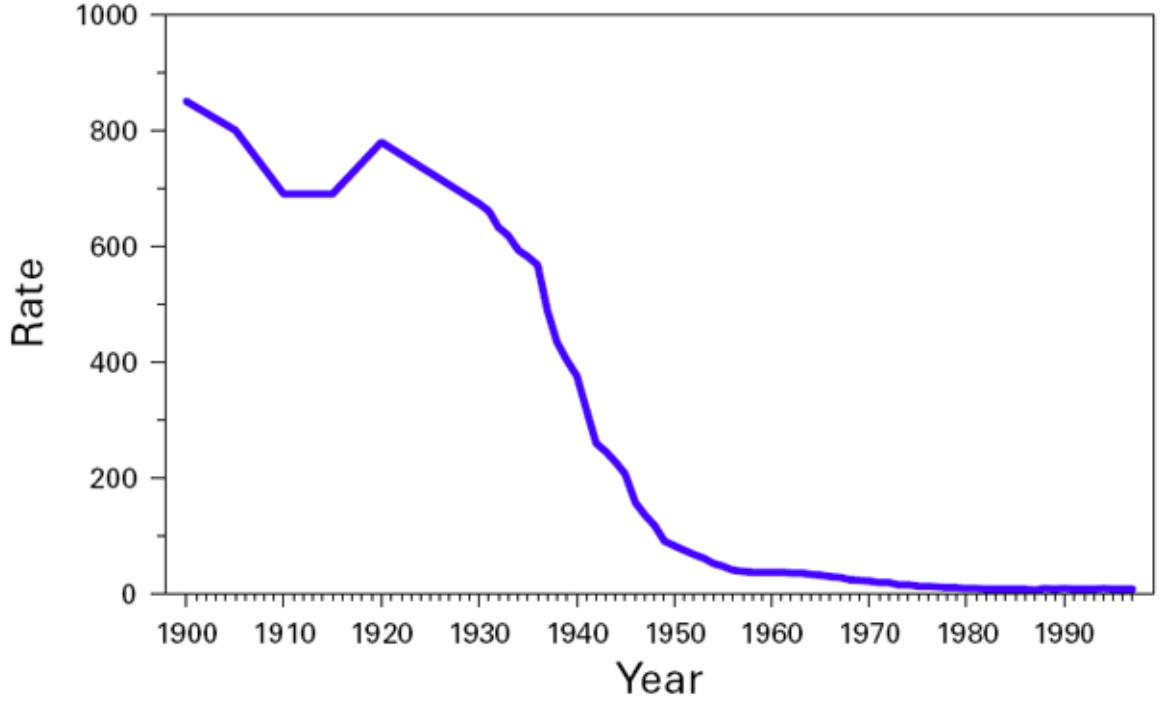
Maternal Mortality in the U.S.

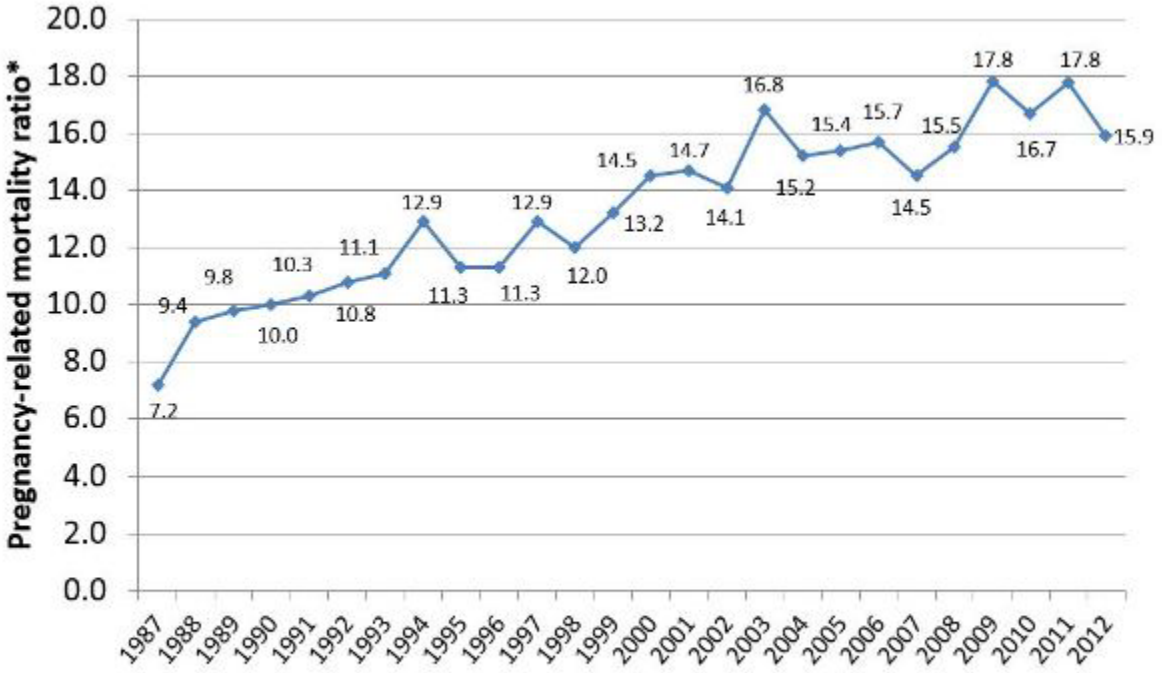
FIGURE 2. Maternal mortality rate,* by year — United States, 1900–1997



*Per 100,000 live births.

Source: CDC

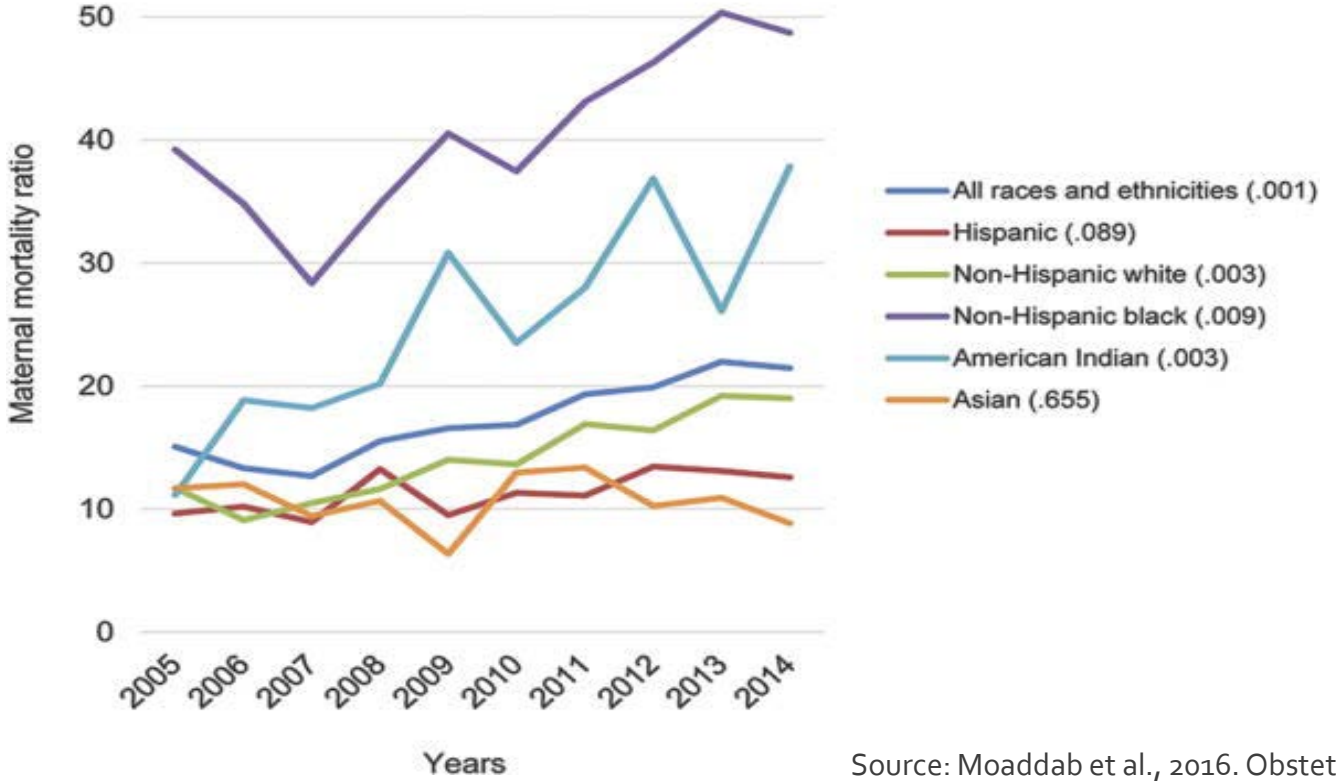
PRMR Trends in the U.S., 1987-2012



*Note: Number of pregnancy-related deaths per 100,000 live births per year.

Source: CDC.gov

Trends in Maternal Mortality by Race/Ethnicity, U.S. 2005-2014



Source: Moaddab et al., 2016. Obstet Gynecol

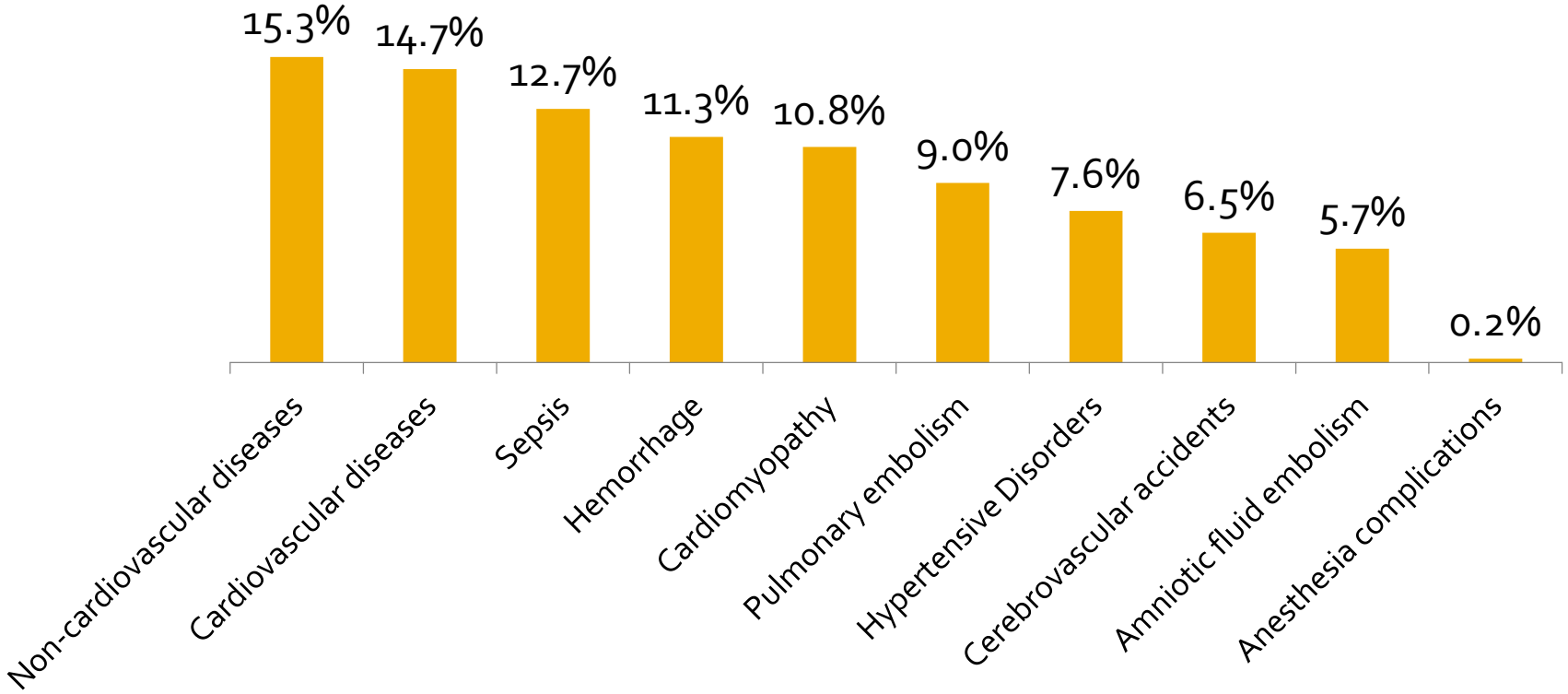
State Maternal Mortality Ratios by Race/Ethnicity, U.S. 2005-2014

State	Total	Hispanic	NH White	NH Black	Native American	Asian
#1 – Massachusetts	5.6	6.9	3.9	17.0	0	4.9
#17 – Illinois	12.4	7.4	9.5	29.9	0	10.3
#41 – New Mexico	**23.0**	**25.5**	**14.9**	**83.0**	**23.7**	0
#51 – Washington DC	38.8	7.4	0	70.6	0	0
U.S. Overall	17.2	11.3	14.1	40.2	25.1	10.6

Maternal Mortality Ratio = Maternal Deaths/100,000 Live Births

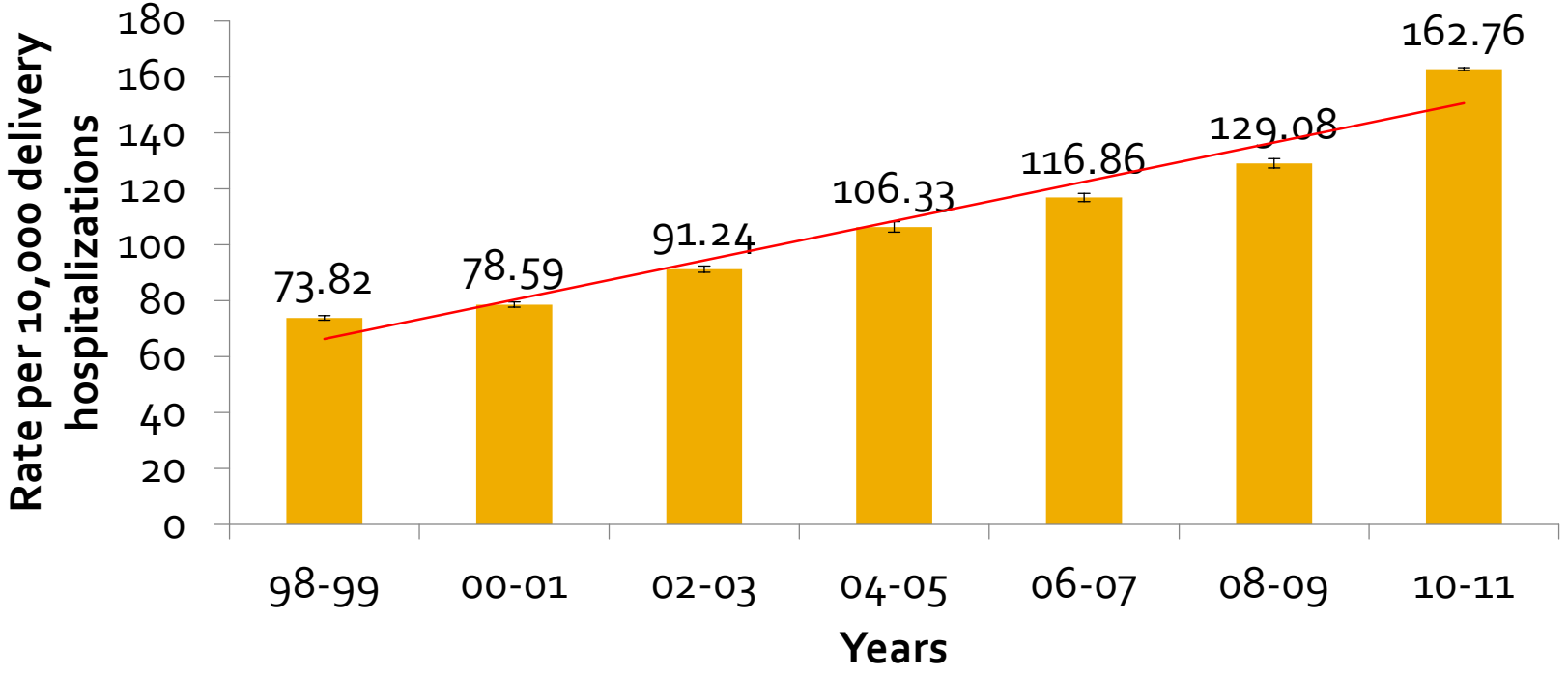
Source: Moaddab et al., 2016. Obstet Gynecol

Causes of Pregnancy-Related Death in the U.S., 2011-2012



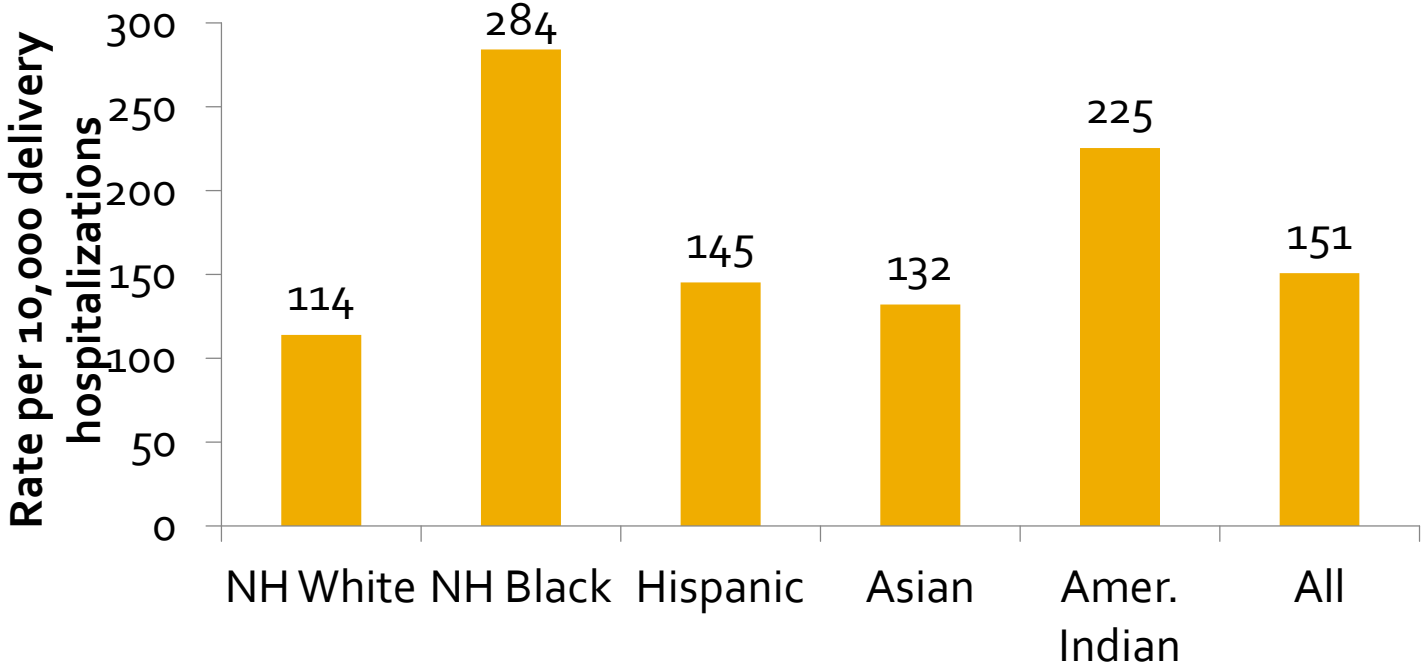
Source: CDC.gov

Trends in Severe Maternal Morbidity in the U.S., 1998-2011



Source: Creanga et al. 2014

Racial/Ethnic Disparities in SMM

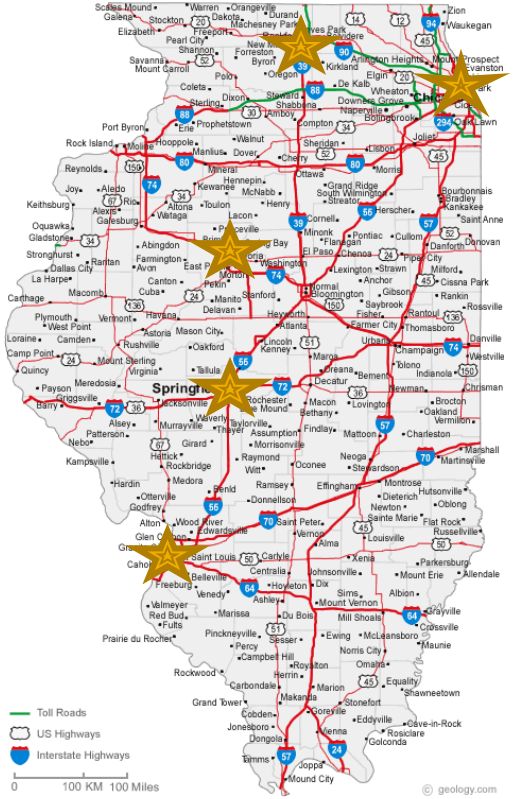


Source: Creanga et al. 2014

Maternal Mortality and Morbidity Review: Lessons from Illinois

Regionalized Perinatal System

- 10 perinatal centers supervise all obstetric hospitals in Illinois since 1976
  - 6 in Chicago metro area (UIC, Rush, Northwestern, U of Chicago, Loyola, Stroger)
  - Rockford
  - Peoria
  - Springfield
  - St. Louis



Background

- Surveillance for maternal mortality in Illinois began in 1982 under IL Admin Code 77 sec 57
  - Maternal death was defined "a death caused by direct or indirect complications of pregnancy occurring during the prenatal period or within 90 days after delivery or termination of the pregnancy"
- Pregnancy checkbox added to death certificate in 1989

Background

- Perinatal Centers began reviewing maternal deaths to collect information beyond the death certificate (1992)

- Maternal Death Review section of IL code amended (2002)
  - Maternal death redefined as "the death of any woman of any cause while pregnant or within 1 year of termination of the pregnancy irrespective of the duration of the pregnancy at the time of the termination or the nature of its termination."

Identification and Record Collection

- Hospitals required to report any maternal death to IDPH within 24 hours
  - Maternal deaths are also identified using:
    - death certificate check box, vital records linkages, and review of obituaries and news reports
- IDPH collects records from hospital, coroner or medical examiner, and other health care providers
  - Must comply with request within 30 days

Legal Protection for Maternal Mortality Review

- Medical records and the content of mortality review determinations are privileged and protected from legal discovery under the Medical Studies Act (735 ILCS 5/8-2101, www.ilga.gov/legislation)
- Model legislation can be found at AMCHP MMR Resource Portal (http://www.amchp.org/programsandtopics/womens-health/Focus%20Areas/MMR)

Perinatal Center/Hospital Reviews

- Standardized abstract and review forms
  - Determination of death:
    - Directly, indirectly or associated to pregnancy
  - Potential preventability of death (Geller model)
    - "any action or inaction on the part of the health care provider, system, or patient that may have caused or contributed to progression to more severe morbidity or death"

Assessing Preventability

- Assess patient, provider, and systems factors which resulted in progression along the continuum of morbidity
  - From point of entry of care to discharge

Categories of Preventability

- Assessment/Entry to Care
- Refer to Expert
- Diagnosis
- Treatment
- Management hierarchy
- Education
- Communication
- Policies and procedures
- Documentation
- Discharge

Maternal Mortality Review Committee

- Statewide Maternal Mortality Review Committee (MMRC) formed in 2000 to:
  - Improve maternal care in state
  - Reduce preventable maternal deaths
- Review a subset of maternal deaths to determine whether death was related to pregnancy and potentially preventable

Maternal Mortality Review Committee

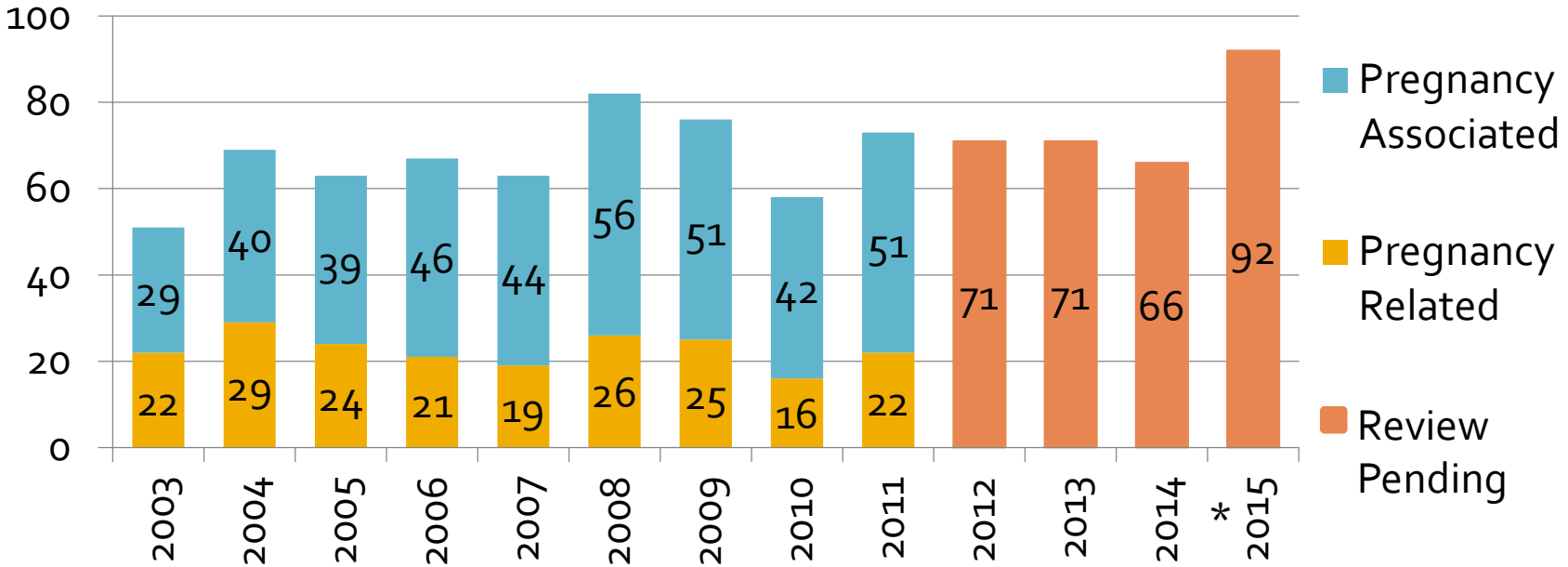
- Meets 4 times/year
- Reviews cases based on:
  - Specific topics (hemorrhage, hypertensive disorders)
  - At request of perinatal center
  - Mostly pregnancy-related in-hospital deaths
  - De-identified to patient, provider, and hospital
- Potential preventability of death

Maternal Mortality Review Committee

- Multidisciplinary expert panel
  - Obstetrician/Gynecologist
  - Maternal Fetal Medicine specialist
  - Advance practice nurse/certified nurse midwife
  - Cardiologist who specializes in pregnancy
  - Anesthesiologist
  - Coroner
  - Pathologist
  - Lawyer
  - Perinatal network administrator
  - Health educator
  - Maternal and child health epidemiologist

Maternal Deaths in IL

- 752 Maternal deaths in database as of 6/20/14

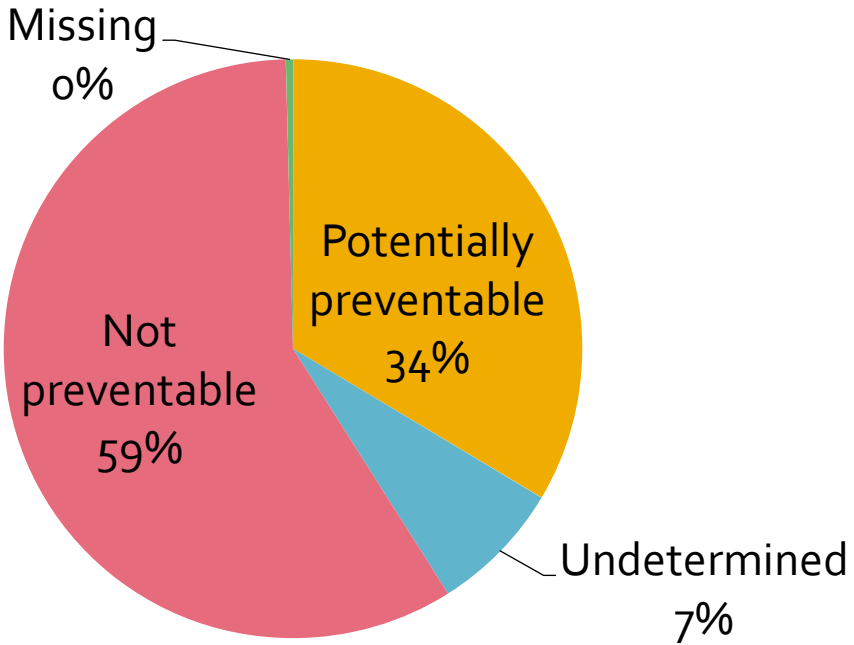


*Data for 2012-2014 is not complete due to time required to obtain records.

Major Causes of Pregnancy-Related Deaths in IL

Cause of Death	Examples	n	%
Vascular	AFE, PE, cerebrovascular events, chronic HT	77	30.0%
Cardiac	Cardiomyopathy, heart disease, dysrhythmias	46	17.9%
Hemorrhage	Uterine rupture, atony, lacerations	38	14.8%
Pre-eclampsia/ Eclampsia	Pre-eclampsia/ Eclampsia	18	7.0%
Infection	Puerperal, due to spontaneous AB	16	6.3%
Cancer	Breast, leukemia, lymphoma, melanoma	13	5.1%
Pulmonary	Pneumonia, asthma	13	5.1%
Other	Psychiatric, anesthesia, hematologic, hepatic	35	14.3%

Preventability* of Pregnancy-Related Deaths in IL

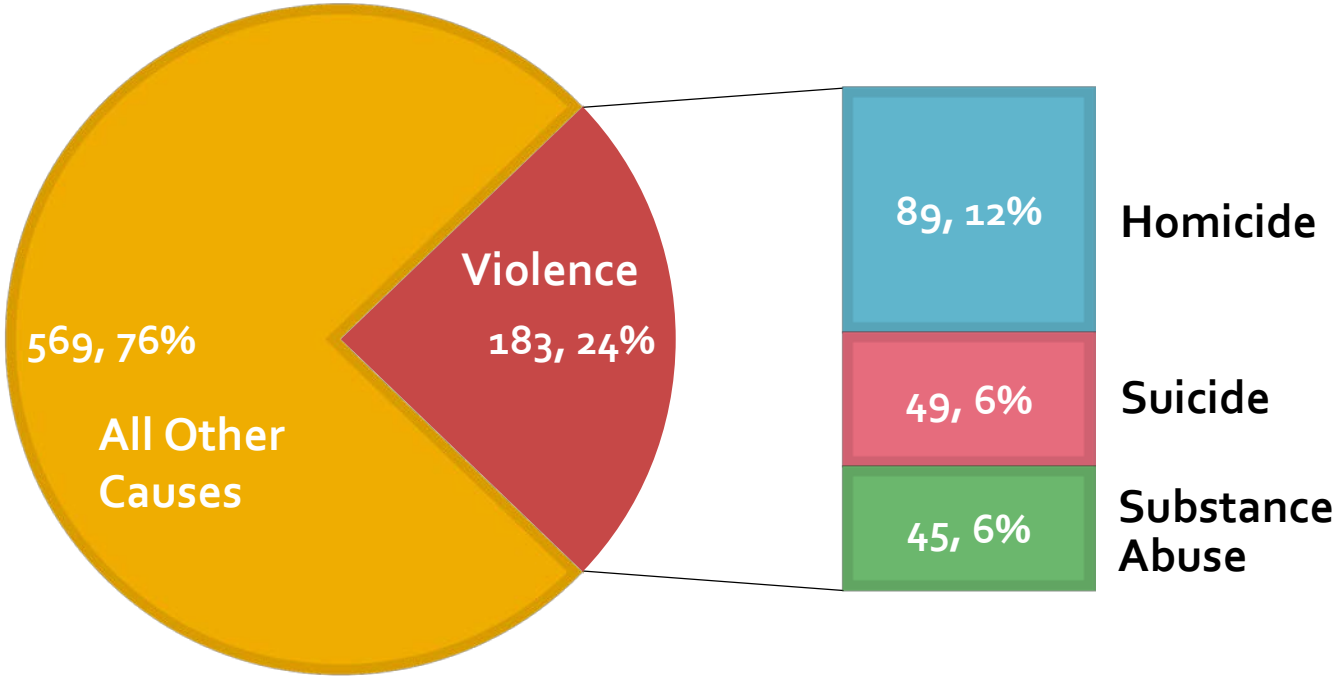


*Preventability as determined by perinatal center review

MMRC vs. Perinatal Center Reviews

- Compared 76 cases reviewed by both MMRC and Perinatal Centers
- MMRC disagreed with PC review on:
  - Cause of death (55.3%)
  - Potential preventability (48.7%)
- MMRC found more cases potentially preventable compared with PCs (70% vs. 41%)
  - Provider & system factors vs. patient factors

Maternal Deaths in IL, 2002-2014



Maternal Deaths Due to Violence

- MMRC-V formed to examine maternal deaths due to homicide, suicide, and substance abuse
  - Many deemed pregnancy-associated but not related
  - MM Review form re-aligned with relevant information
  - Expands capacity for state-level maternal mortality review

MMRC-V

- Convened stakeholder meetings to:
  - Develop review process and data collection form to include social determinants of health
- Identified appropriate committee members
  - Added intimate partner violence advocates, psychologists, trauma specialists, and maternal substance abuse expert
- Data sharing agreements with Violent Death Reporting System and other IDPH data systems

Translating Findings from Maternal Mortality Reviews

Obstetric Hemorrhage Project

- Mandated education for all obstetric providers
  - Written pre-test
  - Didactic lecture
  - Skill stations (blood loss estimation)
  - Simulation drill
  - Debriefing
  - Hospitals developed obstetric hemorrhage policy and rapid response teams
  - Post-test 6 months after completion

Obstetric Hemorrhage Project

- All providers across Illinois showed improvement in knowledge at post-tests
- Improvement in hospital preparedness
  - Decrease in time to stat labs and blood products
  - Increase in OB personnel & OB hemorrhage drills
  - Increase in policies on hemorrhage
- Provider behavior changed
  - Increase in use of appropriate interventions
  - Decrease in number of ICU admission for PPH

Maternal Hypertension Initiative

- Reduce the rate of severe morbidities in women with severe preeclampsia, eclampsia, or preeclampsia superimposed on pre-existing hypertension by 20%

COUNCIL ON PATIENT SAFETY IN WOMEN'S HEALTH CARE
safe health care for every woman

IL PQC
Illinois Perinatal Quality Collaborative

Maternal Hypertension Initiative

- Readiness
  - Every unit must have protocols, drills, rapid access to medications, and system plan for escalation
- Recognition & Prevention
  - Standard protocol for assessment of all pregnant and postpartum women
  - Standard patient education on warning signs

Maternal Hypertension Initiative

- Response
  - Facility-wide standard protocols with checklists and escalation policies for management and treatment of every case of severe hypertension/ preeclampsia
- Reporting/Systems Learning
  - Post event debriefs
  - Multidisciplinary review for systems issues of all cases admitted to ICU

IL Perinatal Quality Collaborative

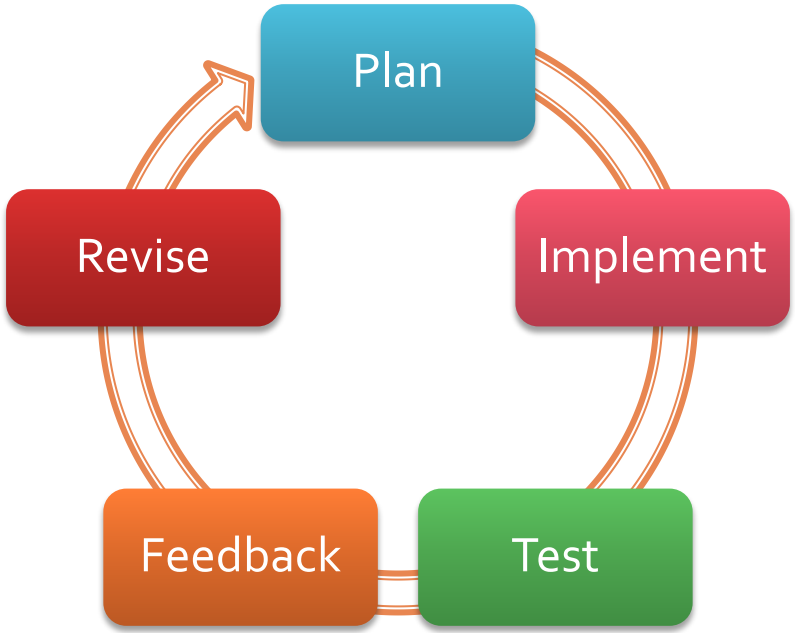
- Birth Certificate Accuracy Initiative
  - Accuracy went from 87% in 2014 to 97% in 12/2015
- Reducing Early Elective Deliveries
  - EED went from 2.32% in 2013 to 1.81% in 12/2014

Severe Maternal Morbidity Review

- Facility-level review recommended by CDC and ACOG
  - Identify opportunities for improvement and successes
- SMM defined as ICU admission and/or transfusion ≥4 units
  - From conception to 6 weeks postpartum
  - 50:1 ratio of SMM to maternal mortality

Implementing Severe Maternal Morbidity Review

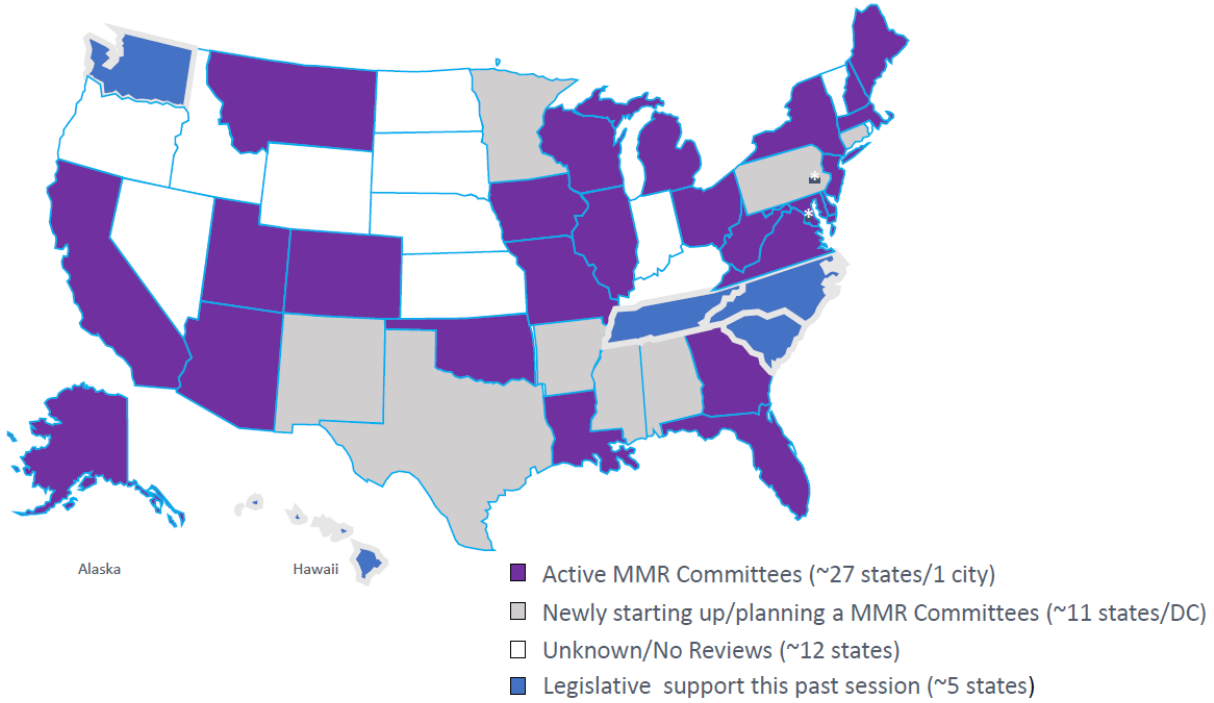
- Convened stakeholders for monthly planning meetings
  - Title V director
  - IDPH Office of Women's Health and Family Services
  - Perinatal network administrators and nurse educators
  - Implementation Scientists



Key Steps for Review of Deaths and Morbidities

- Legislation
  - Mandate reporting of maternal deaths
  - Protect records and committee from legal discovery
- Infrastructure
  - Personnel for collection of medical records and data abstraction
- External Multidisciplinary team
  - Explore system and community factors

The Maternal Mortality Review Universe: Today ♦



♦ Our Best Estimate

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Source: CDC "Reducing Maternal Deaths in the US: Building Maternal Mortality Review Capacity"

Thank You