Building a Strong MCH Foundation to Weather Storms: Skills-building in Reproductive Health Preparedness Science

Marianne Zotti, DrPH, MS, FAAN
Etobssie Wako, MPH
Amy M. Williams, MPH
Consultants, MANILA Consulting Group, INC

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Division of Reproductive Health
Learning Objectives

- Learn about 3 tools specific to MCH emergency preparedness and response
- Estimate the number of pregnant women in a geographic area
- Discuss use of the Reproductive Health Assessment After Disaster (RHAD) Toolkit
- Become familiar with the 2 stage sampling with referral method used in the RHAD Toolkit
- Discuss the use of post-disaster reproductive health indicators in post-disaster surveillance and assessment
Introductions
Pregnant Women and Catastrophic Events

- Classified as ‘at-risk individuals’
- Disproportionate burden in some infectious diseases
- Disaster exposure associated with:
  - Preterm birth or having low birth weight infants
  - Increases in maternal risk factors
  - Increase in psychological stress
  - Separation from family and support systems
  - Exposure to environmental contaminants
  - Lack of access to health care and medications
- Lack of surveillance
Postpartum Women and Catastrophic Events

- Lack of access to contraception and reproductive health care
- Lack of access to well-child and acute care
- Effects on infant feeding
  - Exposure to contaminants can affect breastfeeding
  - Lack of access to potable water may affect formula feeding
- Loss of infant care supplies
- Increase in psychological stress
- Separation from family and support systems
Disaster and Women of Reproductive Age (WRA)

- Inconsistent changes in birth rate after disaster
  - Increases after Hurricane Hugo and OK City bombing
  - Decreases after Hurricane Katrina and 1997 ND Red River Flood

- Little known about disaster effects on WRA in US
  - No routine surveillance of disaster-affected WRA
  - Inconsistent reports of intimate partner violence
  - Inadequate studies on contraceptive use, access to medical and social services, risk behaviors, etc.
Basic Information About U.S. Disasters

- Currently ~58 federally declared disasters per year
- Occur in all states and territories
- Federally declared by county
- 2 types of assistance available from FEMA
  - Individual Assistance
  - Public Assistance
- Types of disasters
  - Fires
  - Floods
  - Earthquakes
  - Hurricanes
  - Tornadoes
  - Winter storms
  - Man-made events
Man-made Disaster
World Trade Center Attack—Ground Zero
9/11/2001
Hurricane Sandy October 29, 2012
Atlantic City and New York City
Role of MCH Emergency Preparedness and Response at Tribal, State and Local Levels

- Identify salient reproductive health conditions and outcomes to be monitored via surveillance or post-disaster data collection
- Develop recommendations and tools to guide post-disaster public health response to MCH populations
- Develop a plan to reduce post-disaster fertility risks, infertility, or inadequate access to contraception
- Develop preparedness and post-disaster communication for clinical, public health, and government partners, and for pregnant women
Training on 3 Tools

- Pregnancy Estimator
- Reproductive Health Assessment After Disaster (RHAD) Toolkit
- Post-disaster Indicators for Pregnant and Postpartum Women and Infants
Pregnancy Estimator

- When There is an Emergency: Estimating the Number of Pregnant Women in a Geographic Area

  Provides estimation tool for a jurisdiction

  Calculates number of pregnant women at a point in time

  Uses pregnancy rates

Before You Start

- **Determine Data Use:** How will this point-in-time estimate assist your program, policy or research initiatives?

- **Determine Partners:** Communicate with the appropriate official contacts for the Title V Maternal and Child (MCH) Block Grant, the Public Health Emergency Preparedness (PHEP) cooperative agreement, and pertinent others.
Step 1 of 3

- Determine geographic area for which you’ll be producing an estimate
  
  **Preparedness:** Choose your geographic area. It may be your state or selected counties.
  - National Atlas Data Download
  - www.census.gov/geo/www/cob

  **Location of the disaster area:** Identify the location of the disaster or affected area (inclusive counties or census tracts) from the Federal Emergency Management Agency (FEMA) GIS site.
  - http://gis.fema.gov
FEMA Declared Counties Hurricane Sandy New Jersey

- [ ] http://gis.fema.gov
- [ ] Choose data feeds
- [ ] Select disaster
- [ ] 2012 disasters
- [ ] Hurricane Sandy
- [ ] New Jersey
- [ ] Pdf of map
Step 2 of 3

- **Determine the number of women of reproductive age (WRA) within the disaster affected area**
  - WRA=Females 15-44 years of age
  - Sources for this information:
    - Your state’s vital statistics data
    - U.S. Census Bureau’s American Fact Finder (AFF) at [http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml](http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml)
    - CDC’s National Center for Health Statistics (NCHS) Vital Statistics program
Step 3 of 3

- Use the components of the Pregnancy Rate to calculate the number of pregnant women in a jurisdiction at a point in time:
  - Fertility rate (live births)
  - Induced abortions
  - Fetal losses (deaths)

- Adjust each component of the pregnancy rate to reflect the proportion of the 12 months of the annual rate that each outcome represents.
  - Birth—9 months (.75)
  - Induced abortions—2 months (.167)
  - Fetal losses (deaths)—3 months (.25)
Fertility Rate (Births)

Fertility Rate =
\[
\frac{\text{number of live births during time period}}{\text{total population of females age 15-44 at mid-point of time period}} \times 1,000
\]

(Not to be confused with) Crude Birth Rate =
\[
\frac{\text{number of live births during time period}}{\text{total population at mid-point of time period}} \times 1,000
\]
Induced abortion rates

Nearly one-fifth of U.S. pregnancies end in induced abortions. This proportion varies widely across geographic areas and among different demographic subpopulations, making local estimation virtually impossible unless local numbers are available.

- Because of the wide variation by geographic areas, we suggest that you use local abortion data from state vital statistics if it is reliable.
- or visit national CDC surveillance data at [www.cdc.gov/reproductivehealth/Data_Stiny/Abortion.htm](http://www.cdc.gov/reproductivehealth/Data_Stiny/Abortion.htm)
Fetal loss rate (deaths)

The fetal loss rate is relatively stable across most geographic areas and demographic groups and nationally is calculated based on reports of fetal loss in the National Survey of Family Growth (NSFG). We recommend using the most recent national fetal loss rate per 1,000 WRA due to its accuracy.

- Apply the national fetal loss rate which can be obtained from the most recent NCHS National Vital Statistics Report [www.cdc.gov/nchs](http://www.cdc.gov/nchs) by searching using the term ‘fetal loss’. Then select the most recent National Vital Statistics Report about rates of pregnancies and pregnancy outcomes.
Now you have all you need

\[ \frac{\text{WRA}}{1000} \times \left\{ (B \times \text{Pb}) + (A \times \text{Pa}) + (D \times \text{Pd}) \right\} = \text{Your Point in Time Estimate} \]

- \( b \)=fertility rate
- \( a \)=abortion rate
- \( d \)=fetal loss (death rate)

- \( \text{Pb} \): 9 months = 0.75
- \( \text{Pa} \): 2 months = 0.167
- \( \text{Pd} \): 3 months = 0.25
Example

Let us review the example on the back of your estimator document.

\[
\frac{WRA}{1000} \times \left\{ (B \times Pb) + (A \times Pa) + (D \times Pd) \right\} \\
= \frac{607,707}{1000} \times \left\{ (65.8 \times 0.75) + (3.8 \times 0.167) + (17.1 \times 0.25) \right\} \\
= 607.7 \times \left\{ (49.35) + (0.63) + (4.28) \right\} \\
= 607.7 \times (54.26) \\
= 32,974
\]

Approximately 33,000 women in “Atlantic” were pregnant at any given point in time in 2010.
What if you have numbers instead of rates?

\[(NB\times Pb) + (NA\times Na) + (ND\times Pd)\]

- NB = number of births
- NA = number of abortions
- ND = number of deaths
- Pb: 9 months = 0.75
- Pa: 2 months = 0.167
- Pd: 3 months = 0.25
Summary of Estimating the Number of Pregnant Women at a Point in Time

- You can do these calculations for preparedness or response
- You may need to include or inform others as you make your calculations
- You are likely to be able to do all steps with information provided by your vital statistics department
- You can estimate whether you have rates or numbers
- Remember you are estimating so you might try using various approaches
- Be sure to record your rationale for decisions you make in the process
Group Exercise
RHAD
Finding MCH Populations for a Post-disaster Assessment
Federally Declared Disaster Counties
Tropical Storm Nicole 2010
So you want to conduct an assessment?

http://cphp.sph.unc.edu/reproductivehealth/
What is Included in the RHAD Toolkit

- Pre-tested questionnaires and variable codebooks
  - Women of Reproductive Age
  - Pregnant and Postpartum Women
  - Topics include safe motherhood, infant care, family planning, family stressors and service needs, health and risk behaviors, and gender-based violence.

- Detailed planning checklist
- Cost estimate and budget template
- Training materials for the survey team
- Sampling instructions and resources
- Resources for data collection and analysis
Prioritize Your Data Needs

- Who is your population of interest?
- What would you like to know about this population?
- How will you be using the data that is captured?
Finding your Population

- **Sampling** is the process of identifying our population of interest.
- There are two general approaches to sampling

<table>
<thead>
<tr>
<th>Probability (Random) Samples</th>
<th>Non-Probability Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Simple random sample</td>
<td>• Convenience sample</td>
</tr>
<tr>
<td>• Systematic random sample</td>
<td>• Purposive sample</td>
</tr>
<tr>
<td>• Cluster sample</td>
<td></td>
</tr>
</tbody>
</table>
Cluster Sampling

For the purpose of RHAD Toolkit, a cluster is a small group of households, within a geographic unit (census blocks or block groups) that is within the community being assessed.

The RHAD Toolkit provides detailed instruction on how to identify and select clusters.
Strategies to Improve Sampling Efficiency

- Exclude blocks where there are no households or that are industrial
- Exclude blocks where the median age is >45
- Conduct interviews in early evenings and on weekends
- Use the modified CASPER after a fairly widespread disaster
- Ensure that census blocks eligible for inclusion include areas where confirmed damage, injuries, or death had occurred
- Employ the modified CASPER (2 stage cluster sampling with referral) to increase the proportion of pregnant and postpartum women
### Modified CASPER Cluster Sampling

Simple steps for two-stage sampling with referrals

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>• Select clusters (generally 30)</td>
</tr>
<tr>
<td>Step 2</td>
<td>• Create the maps of the selected clusters, including road names and key landmarks</td>
</tr>
<tr>
<td>Step 3</td>
<td>• Select households within each cluster (generally 7)</td>
</tr>
<tr>
<td>Step 4</td>
<td>• Ask each approached household to refer pregnant and/or postpartum women in the area</td>
</tr>
<tr>
<td>Step 5</td>
<td>• Interview one WRA within the household</td>
</tr>
</tbody>
</table>
Conducting Field Work

**House One:** No one is home
- Go to the next closest house

**House Two:** A 55 year old woman answers the door, she is the only one at home.
- Thank her for her time, and **ask for referral.**
- If no referral, go to the next closest house

**House Three:** A man answers and provides a referral.
- Is the referral within your cluster?
- Or Within any selected cluster?

**House Four:** There are two WRA within the household.
- Interview only one
- Move to next house in the cluster.

**House Five:** A WRA, who does not want to participate in the survey, provides a referral for a pregnant women within the cluster:
- Thank the participant and go directly to the referred household.
QUESTIONS ABOUT THE RHAD AND SAMPLING?
Post-Disaster Indicators for Pregnant/Postpartum Women and Infants

- **Project purpose:** To develop/select a list of common epidemiologic indicators for pregnant and postpartum women (P/PP) women and infants affected by disaster
  - To identify salient conditions and outcomes to be monitored via surveillance or post-disaster data collection
  - To promote use of consistent measures across post-disaster studies
  - To build scientific knowledge regarding disaster effects on P/PP women and infants
Exercise

You are planning to have additional information collected about selected MCH populations in shelter settings. The data collection will be conducted using the National Disaster Morbidity Surveillance Individual (NDMS) Form, then adding 1 additional sheet with up to 5 additional questions. Here are some considerations:

- What population group do you want to collect the additional information on?
- What characteristics of the individual would trigger data collection of the extra data?
- Since you are limited to 5 or less additional questions, how does that affect the indicator that you choose?
### Natural Disaster Morbidity Surveillance Individual Form

**For Active Surveillance with Medical Staff**

#### Part I: VISIT INFORMATION

<table>
<thead>
<tr>
<th>Name of Facility</th>
<th>City</th>
<th>State</th>
<th>Date of Visit</th>
<th>Time of Visit</th>
</tr>
</thead>
</table>

#### Part II: PATIENT INFORMATION

<table>
<thead>
<tr>
<th>Unique identifier/Medical Record Number</th>
<th>Age</th>
<th>Gender</th>
<th>Pregnant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐ ≤ yrs</td>
<td>☐ Male</td>
<td>☐ Yes, due date</td>
</tr>
<tr>
<td></td>
<td>☐ ≤ yrs</td>
<td>☐ Female</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>White</th>
<th>Black/African American</th>
<th>Hispanic or Latino</th>
<th>Asian</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Did reason for visit occur as a result of work (paid or volunteer) involving disaster response or rebuilding efforts? ☐ Yes ☐ No/NA

Activity at time of injury/illness

#### Part III: REASON FOR VISIT (Please check all categories related to patient’s current reason for seeking care)

**TYPE OF INJURY**

- ☐ Abrasion, laceration, cut
- ☐ Avulsion, amputation
- ☐ Concussion, head injury
- ☐ Fracture
- ☐ Sprain/strain

**MECHANISM OF INJURY**

- ☐ Bite/sting, specify: 
  - ☐ Insect
  - ☐ Snake
  - ☐ Other specify: 
- ☐ Burn, specify: 
  - ☐ Chemical
  - ☐ Fire, hot object or substance
  - ☐ Sun exposure
- ☐ Cold/hot exposure, specify: 
  - ☐ Cold (e.g., hypothermia)
  - ☐ Heat (e.g., stress, hyperthermia)
- ☐ Electric shock
- ☐ Fall, slip, trip, specify: 
  - ☐ From height
  - ☐ Same level
- ☐ Foreign body (e.g., glass shard)
- ☐ Hit by or against an object
- ☐ Motor vehicle crash, specify: 
  - ☐ Driver/passenger
  - ☐ Pedestrian/bicyclist
- ☐ Non-fatal drowning, submersion
- ☐ Poisoning, specify: 
  - ☐ Carbon monoxide exposure
  - ☐ Inhalation of fumes, dust, other gas
  - ☐ Ingestion specify: 
- ☐ Use of machinery, tools, or equipment
- ☐ Violence/assault, specify: 
  - ☐ Self-inflicted injury/attempt
  - ☐ Sexual assault
  - ☐ Other assault specify: 

**ACUTE ILLNESS/SYMPTOMS**

- ☐ Conjunctivitis/eye irritation
- ☐ Dehydration
- ☐ Dermatologic/skin, specify: 
  - ☐ Rash
  - ☐ Infection
- ☐ Gastrointestinal, specify: 
  - ☐ Diarrhea
  - ☐ Bloody
  - ☐ Watery
- ☐ Nausea or vomiting
- ☐ Jaundice
- ☐ Meningitis/encephalitis
- ☐ Neurological (e.g., altered mental status, confused/disoriented, syncope)
- ☐ Obstetrics/Gynecology, specify: 
  - ☐ GYN condition not associated with pregnancy or post-partum
  - ☐ In labor
  - ☐ Pregnancy complication (e.g., bleeding, fluid leakage)
  - ☐ Routine pregnancy check-up
- ☐ Pain, specify: 
  - ☐ Abdominal pain or stomachache
  - ☐ Chest pain, angina, cardiac arrest
  - ☐ Ear pain or earache
  - ☐ Headache or migraine
  - ☐ Muscle or joint pain (e.g., back, hip)
  - ☐ Oral/dental pain
- ☐ Respiratory, specify: 
  - ☐ Congestion, runny nose, sinusitis
  - ☐ Cough, specify: 
    - ☐ Dry
    - ☐ Productive
    - ☐ With blood
  - ☐ Pneumonia, suspected
  - ☐ Shortness of breath/difficulty breathing
  - ☐ Wheezing in chest
  - ☐ Sore throat

**EXACERBATION OF CHRONIC DISEASE**

- ☐ Cardiovascular, specify: 
  - ☐ Hypertension
  - ☐ Congestive heart failure
  - ☐ Diabetes
  - ☐ Immunocompromised (e.g., HIV, lupus)
  - ☐ Neurological, specify: 
    - ☐ Seizure
    - ☐ Stroke
  - ☐ Respiratory, specify: 
    - ☐ Asthma
    - ☐ COPD

**MENTAL HEALTH**

- ☐ Agitated behavior (i.e., violent behavior/threatening violence)
- ☐ Anxiety or stress
- ☐ Depressed mood
- ☐ Drug/alcohol intoxication or withdrawal
- ☐ Previous mental health diagnosis (i.e., PTSD)
- ☐ Psychotic symptoms (i.e., paranoia)
- ☐ Suicidal thoughts or ideation

**ROUTINE/FOLLOW-UP**

- ☐ Medication refill
- ☐ If yes, how many medications?
- ☐ Blood sugar check
- ☐ Vaccination
- ☐ Blood pressure check
- ☐ Wound care

**OTHER**

- ☐ Influenza-like illness (ILI) – Fever (temperature of 100°F [37.8°C] or greater) AND a cough or a sore throat in the absence of a KNOWN cause other than influenza

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**Part IV: DISPOSITION**

- ☐ Discharge to self care
- ☐ Refer to other care (e.g., clinic or physician)
- ☐ Admit/refer to hospital
- ☐ Left before being seen
- ☐ Deceased
Group Exercise
Summary

- Learn about 3 tools specific to MCH emergency preparedness and response
- Estimate the number of pregnant women in a geographic area
- Discuss use of the Reproductive Health Assessment After Disaster (RHAD) Toolkit
- Become familiar with the 2 stage sampling with referral method used in the RHAD Toolkit
- Discuss the use of post-disaster reproductive health indicators in post-disaster surveillance and assessment
The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.