

INDICATORS FOR DISASTER-AFFECTED PREGNANT WOMEN,
POSTPARTUM WOMEN AND INFANTS

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Introduction

Disaster has been associated with a decrease in access to healthcare and medications, increased stress and maternal risk factors, and poor birth outcomes. However, these associations have not been shown consistently, perhaps partly due to disparate study designs, measures of exposure, and outcomes. To bring consistency to the study of post-disaster factors affecting pregnant and postpartum women and infants, the CDC Division of Reproductive Health (DRH) Emergency Preparedness and Response Program initiated a collaborative process with partners to identify a list of common post-disaster epidemiologic indicators for this at-risk group. The purposes of the project are below.

Purposes for developing a list of common epidemiologic indicators for pregnant and postpartum (P/PP) women and infants affected by disaster:

1. To identify salient conditions (e.g. infant feeding, gender-based violence) and outcomes (e.g. maternal and birth outcomes) to be monitored via surveillance or post-disaster data collection.
2. To promote use of consistent measures across post-disaster studies.
3. To build scientific knowledge regarding disaster effects on P/PP women and infants.

Focus

The focus was on catastrophic events, defined as any disaster “including terrorism, that results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions” (National Response Framework, January 2008). For this project we did not focus on infectious diseases or pandemic illnesses.

Populations of Interest

Women who are pregnant, infants ≤ 6 months old, and women who gave birth to an infant ≤ 6 months ago.

Process

We started with large group conversations at national meetings during 2011-2012 to learn about practical field issues and perceived needs of pregnant and postpartum women and infants after disaster. Then we conducted focused monthly discussions with a nationwide group where we invited 28 federal, state, American Indian/Alaska Native, and academic partners to further define perceived needs and outcomes and how they could be measured. This document is a product of these discussions and includes indicators and suggested measures for each population group. The ‘Other Measures’ tables included at the end of this document capture measures that frequently came up in the conversations but were not critical for assessing the selected indicators. The document also contains new or adapted measures that need to be pretested.

Use of Indicators

The following indicators are primarily to guide assessment and surveillance and affect public health interventions to disaster-affected P/PP women and infants. Hence, wherever possible, the focus is on actionable items where public health programs, interventions, and policy can be used or adapted to meet needs. We do not envision that all indicators or measures will be used in every assessment or surveillance tool, but that the user will select what indicators are important and what aspects of the indicator (measures) need to be explored in a setting.

Important

This document contains sample questions as measures; it is not a questionnaire. Thus, as you select questions for your questionnaire, you will need to ensure that you add interviewer directions, transitions, appropriate skips, and response codes. For example, you need to direct the interviewer in the event the mother gave birth to more than one infant during the last pregnancy. Your directions could read like this: “For respondents with more than one infant 6 months old or younger, questions pertaining to the infant should be asked regarding the firstborn.”

Some aspects of this survey, such as the section on gender based violence, are sensitive in nature. As such, a concerted effort should be made to train all interviewers on the ethical components of survey implementation, including protecting the confidentiality, privacy, and safety of all respondents. In addition, interviewers should provide information on referral services when service needs are identified. For sample interviewer scripts, training, and referral lists, please consult the Reproductive Health Assessment After Disaster Toolkit at <http://cphp.sph.unc.edu/reproductivehealth/index.html>.

Several data collections tools are referenced throughout this document, including the following:

- Behavioral Risk Factor Surveillance System (BRFSS)
- Reproductive Health Assessment after Disasters Toolkit (RHAD)
- Natural Disaster Morbidity Surveillance Individual Form (NDMSIF)
- National Immunization Survey (NIS)
- National Intimate Partner and Sexual Violence Survey (NISVS)
- National Survey of Children's Health (NSCH)
- Pregnancy Risk Assessment Monitoring System (PRAMS)

PREGNANT WOMEN

The following 9 indicators are those specific to pregnant women.

Indicator 1: Health Problems during Pregnancy

Chronic and pregnancy induced conditions can affect the health of a woman during and after pregnancy and impact pregnancy outcomes. The conditions identified below require additional medical monitoring during pregnancy.

Measure	Definition	Question Number
Measure 1.1 Health problems during pregnancy	Proportion of women reporting health problems that require ongoing care. Includes diabetes, vaginal bleeding, urinary tract infections, severe nausea and vomiting, hypertensive disorders, heart problems, and any others identified by the interviewee. This item has been pretested.	M1

Indicator 2: Access to Prenatal Care

It is widely agreed that receipt of prenatal care (PNC) is associated with improved pregnancy outcomes, especially among women with medical and/or social risk. Post-disaster studies have demonstrated that access to PNC may be affected by a variety of system and personal barriers. Decreasing barriers to needed medical, nutritional, and social services is a public health core function.

Measure	Definition	Question Number
Measure 2.1 Trimester of prenatal care (PNC) initiation	PNC initiation reported in weeks or months of pregnancy, and then converted to trimester. This item has been pretested.	E1
Measure 2.2 Access to PNC since disaster	Series of questions about whether woman obtained PNC since the disaster, site where woman obtained PNC, and barriers if she did not obtain PNC. These items have not been pretested.	E2, E3, E4

Indicator 3: Access to WIC

WIC is a government program that provides supplemental foods, breastfeeding promotion and support, nutrition education, and health care referrals for low-income pregnant and postpartum women, as well as infants and children up to age five who are found to be at nutritional risk. A disaster may greatly impact a pregnant woman's access to food and nutritional services. Programs such as WIC or Food Stamps may help to meet these needs.

Measure	Definition	Question Number
Measure 3.1 Use of WIC services before disaster	Proportion of pregnant women reporting that they were on WIC before the disaster. This item has not been pretested.	H1
Measure 3.2 Access to WIC or other nutritional services	Series of questions about whether a pregnant woman has used WIC services since the disaster, location where services were obtained, and barriers to access if services were not obtained. These items have not been pretested.	H2, H3, H4

Indicator 4: Disaster Exposure and Access to Mental Health Services

Post-disaster studies have demonstrated that disaster-affected pregnant women may have increased mental issues but not necessarily psychopathology. Furthermore, access to mental health services may be affected by a variety of system and personal barriers.

Measure	Definition	Question Number
Measure 4.1 Access to mental health services since disaster	Series of questions about perceived need for mental health services, whether the woman could access the service, site where woman obtained mental health services, and barriers if she did not obtain mental health services. These items have not been pretested.	C1, C2, C3, C4
Measure 4.2 Disaster Exposure	Measures 8 severe experiences, including feeling that one's life was in danger, experiencing illness or injury to self or a family member, walking through floodwaters, significant home damage, not having electricity for more than 1 week, having someone close die, or seeing someone die. High exposure has been defined as having a score ≥ 3 . These items have been pretested.	K1, K2

Indicator 5: Gender-Based Violence

Disasters have been associated with violence against women. Acts of violence often result in negative physical and emotional health effects. Disaster-affected women may have a current need for services to meet physical/psychological needs and legal/protective services.

Measure	Definition	Question Number
Measure 5.1 Physical intimate partner violence since disaster	Proportion of pregnant women reporting physical violence by husband or partner since the disaster. This item has not been pretested.	L1
Measure 5.2 Physical violence by persons other than intimate partners since disaster	Proportion of pregnant women reporting physical violence by person other than husband or partner since the disaster. This item has not been pretested.	L2
Measure 5.3 Sexual violence by anyone, including intimate partners since disaster	Proportion of pregnant women reporting sexual violence by anyone including husband or partner since the disaster. This item has not been pretested.	L3
Measure 5.4 Perpetrator of sexual violence since disaster	Pregnant woman's relationship to the perpetrator of the sexual violence. This item has not been pretested.	L4
Measure 5.5 Perceived effect of violence on physical or emotional health	Proportion of pregnant women reporting perceived effects of the violence on physical or emotional health. This item has been pretested.	L5
Measure 5.6 Sought treatment for effects of violence	Proportion of pregnant women who have experienced violence since the disaster and sought treatment from a doctor, counselor, or any other medical care provider for resulting physical and/or emotional problems. This item has been pretested.	L6
Measure 5.7 Current need for services for family violence	Proportion of pregnant women reporting current need for services to reduce violence in family. This item has not been pretested.	L7

Indicator 6: Substance Use

Tobacco use leads to disease and disability, and second hand smoke can lead to negative health effects for an infant. Tobacco use may begin or increase after a disaster given the possible increase in stressors. Also, alcohol and drug problems present significant health risks to the user. A self-reported need for help for an alcohol or drug problem can offer a critical window for intervention.

Measure	Definition	Question Number
6.1 Current number of cigarettes smoked per day	Average number of cigarettes currently smoked per day. This item has been pretested.	Q2
6.2 Needs help to quit smoking	Proportion of pregnant women who report that they currently need services to help them quit smoking. This item has not been pretested.	Q3
6.3 Average weekly alcohol consumption since disaster	Average number of alcoholic drinks consumed during an average week since the disaster. This item has been pretested.	Q4
6.4 Self-reported need for help for an alcohol or drug problem	Proportion of pregnant women who report that they currently need services to help with an alcohol or drug problem. This item has not been pretested.	Q5

Indicator 7: Family and Social Support

Family and social support networks are important for pregnant women, especially after a disaster event. A disaster may result in a woman losing her support network.

Measure	Definition	Question Number
7.1 Effect of disaster on social network	Proportion of women reporting that they were separated from loved ones whom they felt close to because of disaster. This item has not been pretested.	K1
7.2 Frequency of receipt of social and emotional support since the disaster	Reported frequency of receipt of social and emotional support since the disaster among pregnant women. This item has not been pretested.	K2
7.3 Presence of social support since the disaster	Proportion of pregnant women who report that someone would help them if a problem came up since the disaster. This item has not been pretested.	K3
7.4 Perceived tangible support since the disaster	Series of questions that list tangible supports that the pregnant woman perceives as available to her since the disaster: someone would loan her \$50, someone would help her if she was sick and needed to be in bed, someone would take her to the clinic or doctor's office if she needed a ride, and someone would talk with her about her problems. These items have not been pretested.	K4

Indicator 8: Access to Sexually Transmitted Infection (STI) Services

Treatment of STIs during pregnancy is important for maternal and infant health. Access to STI treatment may be affected by a variety of system and personal barriers.

Measure	Definition	Question Number
Measure 8.1 Access to STI services since disaster	Series of questions about perceived need for STI services, whether the woman could access the service, site where woman obtained STI services, and barriers if she did not obtain STI services. These items have not been pretested.	F1, F2, F3, F4

Indicator 9: Need for Services

Pregnant women are an at-risk population with unique service needs after a disaster event. Access to many services may be affected by a variety of system and personal barriers.

Measure	Definition	Question Number
Measure 9.1 Identified need for services	Self-reported need for health and social services, including housing, food stamps, school or vocational training, transportation, medical services, dental services, and various social support services. This item has not been pretested.	O1

POSTPARTUM WOMEN

The following 10 indicators are those specific to postpartum women.

Indicator 1: Breastfeeding

Breastfeeding is the safest and often the only reliable source of nutrition for infants affected by disasters. Breastmilk alone is sufficient to support optimal growth and development for approximately six months after birth.

Measure	Definition	Question Number
Measure 1.1 Ever breastfed	Proportion of postpartum (PP) women who breastfed or pumped any amount of breastmilk to feed their infant at any point after delivery. This item has been pretested.	J1
Measure 1.2 Currently breastfeeding	Proportion of PP women who are currently breastfeeding or feeding any amount of pumped milk to their infant. This item has been pretested.	J2
Measure 1.3 Relactation because of disaster	Proportion of PP women who initiated relactation because of the disaster. For some mothers and infants, once breastfeeding has stopped, it may be resumed successfully. This item has not been pretested.	J3
Measure 1.4 Disaster impact on breastfeeding	Proportion of PP women who chose not to initiate breastfeeding, to stop breastfeeding, or to supplement breastmilk with formula because of the disaster. This item has not been pretested.	J3
Measure 1.5 Reasons for not initiating, adding formula, or stopping breastfeeding completely	Reasons given for not initiating breastfeeding, stopping breastfeeding, or supplementing breastmilk with formula. This item has not been pretested.	J4

Indicator 2: Access to Infant Care Supplies

Disasters have the potential to disrupt a postpartum (PP) woman's access to necessary infant supplies. PP women who are not breastfeeding may need access to potable water to mix with powdered formula for their infant. Safe storage and preparation of pumped breastmilk and infant formula may require access to refrigeration and heating. Lack of access to safe storage and sterile preparation can be detrimental to the health and wellness of the infant. These women, along with PP women who are pumping breastmilk, also need potable water to clean bottles.

Measure	Definition	Question Number
Measure 2.1 Access to supplies needed to care for infant	Series of questions identifying the proportion of PP women reporting difficulty accessing supplies to care for their infant because of the disaster, the specific supplies that were difficult to access, location where supplies were sought, and barriers to access if supplies were not obtained. These items have not been pretested.	G1, G2, G3
Measure 2.2 Difficulty accessing potable water to mix formula or clean bottles	Proportion of PP women who needed potable water to mix formula and/or clean bottles, but had difficulty accessing it because of the disaster.	G4
Measure 2.3 Difficulty storing and/or preparing formula or milk	Proportion of PP women who experienced difficulty refrigerating and/or heating formula or pumped milk because of the disaster. This item has been pretested.	G5

Indicator 3: Access to WIC

WIC is a government program to provide supplemental foods, breastfeeding promotion and support, nutrition education, and health care referrals for low-income pregnant, breastfeeding, and non-breastfeeding PP women, and to infants and children up to age five who are found to be at nutritional risk. A disaster may greatly impact a PP woman's access to food and nutritional services. Decreasing barriers to needed medical, nutritional, and social services is a public health core function.

Measure	Definition	Question Number
Measure 3.1 Use of WIC services before disaster	Proportion of PP women reporting that they were on WIC before the disaster. This item has not been pretested.	H1
Measure 3.2 Access to WIC	Series of questions about whether a PP woman has used WIC services since the disaster, location where services were obtained, and barriers to access if services were not obtained. These items have not been pretested.	H2, H3, H4

Indicator 4: Access to Contraception

Access to contraception is critical in the prevention of unintended pregnancies. A disaster may make it difficult for a woman to access her usual or preferred contraceptive method.

Measure	Definition	Question Number
4.1 Current use of a permanent method	Proportion of PP women who have had their tubes tied or whose partner has had a vasectomy; identifies those who should not be asked the series of questions below about access to contraception. This item has been pretested.	A1
4.2 Use of family planning before disaster	Proportion of PP women who were using a contraceptive method just before the disaster. This item has been pretested.	A2
4.3 Currently practicing family planning	Proportion of PP women who are currently practicing family planning with their partner, including natural family planning methods. This item has been pretested.	A3
4.4 Family planning method currently used	The method being used among PP women who are currently practicing family planning with their partner; includes natural family planning methods. This item has not been pretested.	A4
4.5 Source of contraception	Location where PP women currently using contraception last obtained their contraceptive method. This item has not been pretested.	A5
4.6 Preferred family planning method	The desired method of contraception among PP women. This item has not been pretested.	A6
4.7 Difficulty accessing contraception after the disaster	Proportion of PP women who have had difficulty accessing their contraceptive method since the disaster. This item has been pretested.	A7

Indicator 5: Access to Postpartum Care

A PP checkup is recommended 4-6 weeks after delivery for all women who have given birth. Disasters may present unique challenges to women trying to access PP care. Decreasing barriers to needed medical, nutritional, and social services is a public health core function.

Measure	Definition	Question Number
Measure 5.1 Access to PP care	Series of questions about whether or not a PP woman received a PP checkup after giving birth, location where PP care was obtained, and barriers to access if PP services were not obtained. These items have not been pretested.	D1, D2, D3
Measure 5.2 Disaster related difficulty when accessing PP care	Proportion of PP women who experienced difficulty obtaining a PP checkup because of the disaster. This item has been pretested.	D4

Indicator 6: Access to Mental Health Services

Post-disaster studies have demonstrated that disaster-affected PP women may have increased mental health issues but not necessarily psychopathology. Furthermore, access to mental health services may be affected by a variety of system and personal barriers after a disaster.

Measure	Definition	Question Number
Measure 6.1 Access to mental health services since the disaster	Series of questions about perceived need for mental health services, whether the PP woman could access services, location where mental health services were obtained, and barriers to access if mental health services were not obtained. These items have not been pretested.	C1, C2, C3, C4

Indicator 7: Gender-Based Violence

Disasters have been associated with violence against women. Acts of violence often result in negative physical and emotional health effects. Disaster-affected women may have a current need for services to meet physical/psychological needs and legal/protective services.

Measure	Definition	Question Number
Measure 7.1 Physical intimate partner violence since the disaster	Proportion of PP women reporting physical violence by an intimate partner since the disaster. This item has not been pretested.	L1
Measure 7.2 Physical violence by persons other than intimate partners since the disaster	Proportion of PP women reporting physical violence by a person other than a husband or partner since the disaster. This item has not been pretested.	L2
Measure 7.3 Sexual violence since disaster	Proportion of PP women reporting sexual violence since the disaster; includes acts perpetrated by intimate partners. This item has not been pretested.	L3
Measure 7.4 Perpetrator of sexual violence since disaster	PP woman's relationship to the perpetrator of the sexual violence. This item has not been pretested.	L4
Measure 7.5 Perceived effect of violence on physical or emotional health	Proportion of PP women who have experienced violence since the disaster and perceive an impact to their physical or emotional health. This item has been pretested.	L5
Measure 7.6 Sought treatment for effects of violence	Proportion of PP women who have experienced violence since the disaster and sought treatment from a doctor, counselor, or any other medical care provider for resulting physical and/or emotional problems. This item has been pretested.	L6
Measure 7.7 Current need for family violence services	Proportion of PP women reporting current need for services to reduce violence in their home. This item has not been pretested.	L7

Indicator 8: Substance Use

Tobacco use leads to disease and disability, and second hand smoke can lead to negative health affects for an infant. Tobacco use may begin or increase after a disaster given the possible increase in stressors. Also, alcohol and drug problems present significant health risks to the user. A self-reported need for help for an alcohol or drug problem can offer a critical window for intervention.

Measure	Definition	Question Number
Measure 8.1 Current number of cigarettes smoked per day	Average number of cigarettes currently smoked per day. This item has been pretested.	Q2
Measure 8.2 Change in smoking behavior since disaster	Proportion of PP women whose smoking behavior increased since the disaster. This item has not been pretested.	Q1
Measure 8.3 Need help to quit smoking	Proportion of PP women who report that they currently need services to help them quit smoking. This item has not been pretested.	Q3
Measure 8.4 Self-reported need for an alcohol or drug problem	Proportion of PP women who report that they currently need services to help with an alcohol or drug problem. This item has not been pretested.	Q5

Indicator 9: Family and Social Support

Family and social support networks are important for PP women, especially after a disaster event. Disasters have the potential to disrupt a woman's support network.

Measure	Definition	Question Number
Measure 9.1 Effect of disaster on social network	Proportion of PP women reporting that they were separated from loved ones whom they felt close to because of disaster. This item has not been pretested.	K1
Measure 9.2 Frequency of receipt of social and emotional support since the disaster	Reported frequency of receipt of social and emotional support since the disaster among PP women. This item has not been pretested.	K2
Measure 9.3 Presence of social support since the disaster	Proportion of PP women who report that someone would help them if a problem came up since the disaster. This item has not been pretested.	K3
Measure 9.4 Perceived tangible support since the disaster	Series of questions that list tangible support that the PP woman perceives as available to her since the disaster: someone to loan her \$50, someone to help her if she was sick and needed to be in bed, someone to talk with her about her problems, someone to take care of her baby, and someone to help if she was tired and feeling frustrated with her new baby. These items have not been pretested.	K5

Indicator 10: Need for Services

PP women have unique service needs after a disaster event. Access to many services may be affected by a variety of system and personal barriers.

Measure	Definition	Question Number
Measure 10.1 Identified need for services	Self-reported need for health and social services, including housing, food stamps, school or vocational training, transportation, medical services, dental services, and various social support services. This item has not been pretested.	O1

INFANTS

The following 6 indicators are those specific to infants.

Indicator 1: Birth Outcomes

Birth outcomes measure select aspects of infant health at birth. These outcomes are important measures among disaster affected communities as they are associated with a variety of factors such as maternal health, quality and access to medical care, socioeconomic conditions, and public health practices.

Measure	Definition	Question Number
Measure 1.1 Place of delivery	Location of delivery. This item has not been pretested.	11
Measure 1.2 Full term low birth weight (LBW)	Proportion of Postpartum (PP) women who reported their infants weighed less than 2500 g (5.5 lb.) at birth. This item has been pretested.	13
Measure 1.3 Preterm birth	Proportion of PP women who reported they delivered a live singleton baby at least 3 weeks before their due date. This item has been pretested.	14

Indicator 2: Infant Feeding and Access to WIC

In a disaster event, special consideration must be given to infant nutrition. Breastfeeding is the safest and often the only reliable source of nutrition for infants affected by disasters. Breastmilk alone is sufficient to support optimal growth & development for approximately six months after birth. Disasters may present unique barriers to breastfeeding initiation or continuation. WIC provides federal grants to states for supplemental foods, breastfeeding promotion and support, nutrition education, and health care referrals for low-income P/PP women, and to infants and children up to age five who are found to be at nutritional risk. These services are especially important among at-risk disaster-affected populations.

Measure	Definition	Question Number
Measure 2.1 Ever breastfed	Proportion of PP women who breastfed or pumped any amount of breastmilk to feed their new baby at any point after delivery, regardless of whether or not they are currently breastfeeding. This item has been pretested.	J1
Measure 2.2 Currently breastfeeding	Proportion of PP women who are currently breastfeeding or feeding any amount of pumped milk to their new baby. This item has been pretested.	J2
Measure 2.3 Relactation because of disaster	Proportion of PP women who initiated relactation because of the disaster. For some mothers and infants, once breastfeeding has stopped, it may be resumed successfully. This item has not been pretested.	J3
Measure 2.4 Disaster impact on breastfeeding	Proportion of PP women who chose not to initiate breastfeeding, to stop breastfeeding, or to supplement breastmilk with formula because of the disaster. This item has not been pretested.	J3
Measure 2.5 Reasons for not initiating, adding formula, or stopping breastfeeding completely	Reasons given for not initiating breastfeeding, stopping breastfeeding, or supplementing breastmilk with formula. This item has not been pretested.	J4
Measure 2.6 Access to supplies needed to care for infant	Series of questions identifying the proportion of PP women reporting difficulty accessing supplies to care for their infant because of the disaster, the specific supplies that were difficult to access, location where supplies were sought, and barriers to access if supplies were not obtained. These items have not been pretested.	G1, G2, G3
Measure 2.7 Use of WIC services before disaster	Proportion of PP women reporting that they were on WIC before the disaster. This item has not been pretested.	H1
Measure 2.8 Access to WIC or other nutritional services	Series of questions about whether a PP woman has used WIC services since the disaster, location where services were obtained, and barriers to access if services were not obtained. These items have not been pretested.	H2, H3, H4

Indicator 3: Infant Health and Safety Outcomes

Disaster related injuries and illnesses can exact an enormous toll on population health and well-being. The questions below capture protective measures (such as immunizations) as well as illnesses and injuries.

Measure	Definition	Question Number
Measure 3.1 Ever vaccinated	Proportion of caregivers who reported infants received immunization in the form of a shot or drops. This item has not been pretested.	N1
Measure 3.2 Access to immunization records	Proportion of caregivers who had access to infant immunization records. This item has not been pretested.	N2
Measure 3.3 Help seeking for infant medical concerns	Proportion of caregivers who sought medical help for infant. This item has not been pretested.	N3
Measure 3.4 Reasons for seeking medical help for infant	Reasons why caregiver sought medical help for infant, includes a list of symptoms for acute illness and communicable diseases. This item has not been pretested.	N4
Measure 3.5 Type of injury	Types of injuries reported. This item has not been pretested.	N5
Measure 3.6 Cause of injury	Cause of injury reported. This item has not been pretested.	N6

Indicator 4: Access to Subspecialty Services

A key component of coordinating healthcare services for disaster affected communities is identifying infants who require subspecialty care and special services and connecting those children to needed services.

Measure	Definition	Question Number
Measure 4.1 Access to subspecialty services	Proportion of caregivers who reported that 1) infant required subspecialty care, 2) infant received/did not receive subspecialty care, 3) reasons why infant did not receive subspecialty care. These items have not been pretested.	B1, B2, B3, B4
Measure 4.2 Infant transferred	Proportion of infants transferred before mother's discharge.	B5
Measure 4.3 Mother transferred	Proportion of PP women who reported that they were transferred prior to delivery.	B6
Measure 4.4 Needed assistance in care coordination	Proportion of caregivers who reported they needed extra help coordinating care for their infant. This item has not been pretested.	B7
Measure 4.5 Received assistance in care coordination	How often caregivers received assistance in coordinating their infant's care. This item has not been pretested.	B8

Indicator 5: Safe Sleep Environments

Helping parents and primary caregivers establish a safe sleeping environment for the infant is an important public health function. This is especially important in disaster events when usual sleep space and pattern may be disturbed.

Measure	Definition	Question Number
Measure 5.1 Baby sleeps in a crib	Proportion of PP women who reported that their infant sleeps in crib or portable crib. This item has been pretested.	P1
Measure 5.2 Bed sharing	Proportion of PP women who reported that their infant sleeps in the same bed as mother or someone else. This item has been pretested.	P2
Measure 5.3 Sleep position and surface	Proportion of PP women who reported the position in which their infant sleeps (her/his sides, back, and/or stomach), as well as the surface on which the infant sleeps (firm or hard mattress, with pillows, with pads, with blankets, with stuffed toys, and/or with another person). This item has been pretested.	P3

Indicator 6: Access to Well Baby Care

Infants are at increased risk of morbidity and mortality during the first six months following delivery. It is important to assess the type and level of care disaster-affected infants receive.

Measure	Definition	Question Number
6.1 Ever well-baby checkup	Proportion of women reporting their infant had at least one well-baby checkup. This item has been pretested.	R1
6.2 Well-baby visit location	Self-reported location of well-baby checkup by PP women. This item has been pretested.	R2
6.3 Type of well-baby checkup	The type of care received by infant at a well-baby checkup. This item has not been pretested.	R3
6.4 Well-baby visits impacted by disaster	Proportions of women who report it has been more difficult to get well-baby checkups because of a disaster event. This item has been pretested.	R4
6.5 Barriers to well-baby checkup	Proportion of PP women who report barriers to attending well-baby checkups. This item has been pretested.	R5

OTHER MEASURES

Other Measures for Pregnant and Postpartum Women

Other nationally recognized measures used to screen for depression, stress, anxiety, disaster exposure, and alcohol dependency.

Measure	Tool	Definition	Public Health Significance	Known Application in the United States
Postpartum (PP) Depression	Edinburgh Postnatal Depression Scale	This scale has 10 questions and is designed to screen women for symptoms of emotional distress during pregnancy and the postnatal period. Each item is scored on a four-point scale from 0-3, with minimum and maximum overall scores ranging 0 to 30. Scores 0-9 may indicate some symptoms, but are not likely to interfere with day to day ability to function. Scores 10-12 indicate presence of symptoms of distress that may be discomforting. Scores 13+ require further assessment and referral to a mental health specialist should be considered.	Exposure to disasters and the subsequent stressors that arise as a result may impact a woman's mental health. Depression can significantly disrupt quality of life and make it difficult to perform daily tasks. Depressed women are at increased risk for poor health outcomes and may have difficulty coping with a disaster event.	A score ≥ 12 has been used to indicate depression among disaster-affected pregnant/PP women following Hurricane Katrina ¹ .
Depression	Beck Depression Inventory (BDI)	The BDI is one of the most widely used instruments to measure the severity of depression and consists of 21 questions scored on a scale of 0-3. The severity of depression is scored as follows in the most up-to-date tool (1996): Minimal (0-13), Mild (14-19), Moderate (20-28), Severe (29-63).	Exposure to disasters and the subsequent stressors that arise as a result may impact a woman's mental health. Depression can significantly disrupt quality of life and make it difficult to perform daily tasks. Depressed women are at increased risk for poor health outcomes and may have difficulty coping with a disaster event.	Application of the BDI among pregnant/PP women after the World Trade Center (911) disaster used criteria from an older version (BDI-IA, 1978) to determine severity of depression; normal (0-9), mild depression (10-18), moderate depression (19-29), severe depression (≥ 30) ² .

Post-Traumatic Stress Disorder (PTSD)/ Post Traumatic Stress Symptoms (PTSS)	Post-traumatic Stress Disorder Checklist (PCL)	This scale is a commonly used, 17-item inventory of PTSD-like symptoms, with response alternatives ranging from 1 (not at all) to 5 (extremely). This scale performs particularly well when assessing PTSD relative to a specific event.	Disasters may result in significant trauma for the individuals who experience them, and may result in PTSS or PTSD. PTSD can significantly disrupt quality of life and make it difficult to perform daily tasks. People with PTSS or PTSD may be a greater risk for adverse health outcomes and may have difficulty coping with a disaster event. There is some evidence in post-disaster literature that PTSD may be associated with low birth weight and preterm birth ³	There are several variations in cut off scores when applied to disaster-affected P/PP women. For example, a post-Hurricane Katrina study used a cut off of 50 ¹ , a study after the World Trade Center disaster (911) used a cut off of ≥ 44 ³ , while a different post-911 study used a completely different approach where ≥ 1 moderately distressing symptom of intrusive thoughts (PCL items 1-5), ≥ 3 moderately distressing symptoms of avoidance or numbing (PCL items 6-12), and ≥ 2 moderately distressing symptoms of hyperarousal (PCL 13-17). ³
Anxiety	State-Trait Anxiety Inventory	Measures anxiety through an inventory composed of 40 questions based on a 4-point likert scale. Scores range from 20 to 80, with higher scores correlating with greater anxiety. Engel et al (2005) determined those with "high anxiety" by creating categories and comparing subjects having total scores greater than the 75th percentile with those at or below the 75th percentile.	Experiencing a disaster can exacerbate existing anxiety and result in new stressors, which may facilitate new anxieties for a disaster-affected woman. Anxiety may influence poor mental health outcomes.	This inventory was applied among pregnant/PP women following the World Trade Center disaster. Results were not significant. ²
Stress	Perceived Stress Scale (PSS4)	Measures the relative severity of perceived stress through four questions based on a 4-point likert scale.	Experiencing a disaster can be a major life stressor. Chronic stress can result in negative health consequences and may influence poor mental health outcomes.	No known application in disaster situations, but is a global measure of perceived stress validated in the US. ^{5,6}
Screening for alcohol use and dependence	CAGE and T-ACE screening tests	4 item scales used by clinicians and others to identify patients with alcohol problems. Both scales have been demonstrated as useful in a variety of settings and populations. The T-ACE was designed for use among pregnant women.	Alcohol consumption may begin or increase after a disaster given the subsequent stressors.	These scales are designed for use by counselors and/or clinicians. To our knowledge they have not been used in population-based surveys.

Other Measures for Infants

The table below lists other ways to explore infant health outcomes using vital records. The tools identified include the 2003 birth certificate (BC), 1989 BC, and the 2003 death certificate.

Measure	Tool	Definition	Public Health Significance	Known Application in the United States
Place of birth	2003 Birth Certificate (BC), Q26 1989 BC, Q6a	Location of most recent delivery.	Disasters may impact access to delivery services, or 24 hour/ 72 hour usual baby check-ups. This measure examines where infant was born.	Used by all States. Variability in access to data by State.
Full term low birth weight	2003 BC, Q49; 1989 BC, Q5	Proportion of PP women who reported their infants weighed less than 2500 g (5.5 lb.) at birth.	Low birth weight is an important indicator of the health and welfare among disaster affected populations, as it may reflect disparities in access to early and continuous maternity care and adequate prenatal nutrition.	Used by all States. Variability in access to data by State.
Preterm birth	2003 BC, Q50; 1989 BC, Q20	Proportion of PP women who reported they delivered a live singleton baby 3 weeks before their due date.	Preterm birth is a leading cause of infant mortality and morbidity. Preterm births data are readily available in all state health departments and can be used to examine the contributions of environmental exposures and other modifiable risks.	Used by all States. Variability in access to data by State.
Infant mortality	2003 BC, Q57; 1989 BC, Q26	Number of PP women who reported infant death.	Infant mortality is an important indicator of the health of a nation or community because it is associated with a variety of factors such as maternal health, quality and access to medical care, socioeconomic conditions, and public health practices.	Used by all States. Variability in access to data by State.
Cause of death	2003 Death Certificate, Q32	'Cause of death' as stated on death certificate.	Infant deaths within disaster-affected local community.	Used by all States. Variability in access to data by State.

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