



Maternal and Infant Health Assessment (MIHA) Survey Technical Notes



Maternal, Child & Adolescent Health
mcah

Introduction

The Maternal Infant Health Assessment (MIHA) survey is a population-based survey of women with a recent live birth in California that has been conducted annually since 1999. MIHA collects self-reported information about maternal and infant experiences and behaviors before, during and shortly after pregnancy. Data from MIHA can be used by state and local agencies and stakeholder groups interested in the health of families in California.

MIHA is led by the Maternal, Child and Adolescent Health Division in the California Department of Public Health (CDPH) in collaboration with: CDPH Women, Infants and Children (WIC) Division and the Center for Health Equity at the University of California, San Francisco (UCSF).

The MIHA project is supported by the California Department of Public Health using federal funds from the Title V Maternal and Child Health Block Grant and the Special Supplemental Nutrition Program for Women, Infants and Children.

Included in this document are the indicator definitions ([page 3](#)), a map of MIHA counties ([page 31](#)), a map of MIHA regions ([page 32](#)), the data annotation and suppression criteria ([page 33](#)) and the weighting methods ([page 34](#)) used in publications of MIHA data. Additional information on the MIHA survey can be found on the [MIHA webpage](https://cdph.ca.gov/MIHA) at cdph.ca.gov/MIHA.

Content included in this report may be referenced with the following citation:

Maternal and Infant Health Assessment (MIHA) Survey: Technical Notes. Sacramento: California Department of Public Health, Maternal, Child and Adolescent Health Division; 2022.

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Indicator Definitions

Indicators are based on self-reported data from the MIHA survey and refer to the most recent birth, or pregnancy for the most recent birth, unless otherwise indicated. Unless noted, the denominator for each indicator includes all women with a live birth. Any change to a survey question or indicator, compared to how it was in a prior year, is noted in the Change in Definition and/or Comparability column(s). Indicators listed here are those that have been used in MIHA data publications since 2010.

Prior Poor Birth Outcomes

Indicator	Definition	Years Available	Change in Definition	Comparability
Prior low birth weight or preterm delivery	Prior to the most recent birth, ever had a baby weighing <2,500 grams at birth or born at <37 weeks gestation.	2010-2012	---	---
Prior delivery by c-section	Ever had a cesarean section prior to the most recent birth, reported on the birth certificate.	2010-2012	---	---

Health Status Before Pregnancy

Indicator	Definition	Years Available	Change in Definition	Comparability
In good to excellent health	Self-rated health before pregnancy	2011-2018 for current definition; 2010 for previous definition.	Prior to 2011, definition included self-rated <i>physical</i> health. In 2011, the survey question was changed from two separate questions on physical health and mental health to one question on "health."	Starting in 2011, the indicator is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
			Additional response of “Very good” was added between response categories “Excellent” and “Good.”	
Diabetes	Before pregnancy, told by a health care worker that she had diabetes (high blood sugar).	2013-2018 for current definition; 2010-2012 for previous definition.	Prior to 2013, definition also included diagnosis <i>during this pregnancy</i> with diabetes or with gestational diabetes.	Starting in 2013, the indicator is not comparable with prior years.
Hypertension	Before pregnancy, told by a health care worker that she had hypertension (high blood pressure).	2013-2018 for current definition; 2010-2012 for previous definition.	Prior to 2013, definition also included diagnosis <i>during this pregnancy</i> with hypertension, preeclampsia, eclampsia or toxemia.	Starting in 2013, the indicator is not comparable with prior years.
Asthma	Before pregnancy, told by a health care worker she had asthma.	2013-2018 for current definition; 2010-2012 for previous definition.	Prior to 2013, definition also included diagnosis of asthma <i>during this pregnancy</i> .	Starting in 2013, the indicator is not comparable with prior years.

Nutrition and Weight

Indicator	Definition	Years Available	Change in Definition	Comparability
Daily folic acid use, month before pregnancy	During the month before pregnancy, took a multivitamin, prenatal vitamin or folic acid vitamin every day of the week.	2010-2018	---	---
Overweight before pregnancy	Body Mass Index (BMI) was calculated from weight and height reported on the birth certificate. BMI of 25-29.9 is classified as overweight. BMI was calculated only for women reporting height within 48-83 inches and weight within 75-399 pounds. BMI values outside of 13-69.99 are excluded. <i>BMI may overestimate or underestimate body fatness in some individuals since it does not take into consideration an individual's muscle or bone mass. The clinical correlation of BMI has not been validated in some subpopulations; therefore, BMI should not be used as the sole criteria for making health recommendations.</i>	2016-2018 for current definition; 2010-2015 for previous definition.	Prior to 2016, BMI was calculated with the same method using <i>self-reported</i> weight and height from the MIHA survey.	Starting in 2016, the indicator is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
Obese before pregnancy	<p>Body Mass Index (BMI) was calculated from weight and height reported on the birth certificate. BMI of 30 or greater is classified as obese. BMI was calculated only for women reporting height within 48-83 inches and weight within 75-399 pounds. BMI values outside of 13-69.99 are excluded. <i>BMI may overestimate or underestimate body fatness in some individuals since it does not take into consideration an individual's muscle or bone mass. The clinical correlation of BMI has not been validated in some subpopulations; therefore, BMI should not be used as the sole criteria for making health recommendations.</i></p>	<p>2016-2018 for current definition; 2010-2015 for previous definition.</p>	<p>Prior to 2016, BMI was calculated with the same method using <i>self-reported</i> weight and height from the MIHA survey.</p>	<p>Starting in 2016, the indicator is not comparable with prior years.</p>
Inadequate weight gain during pregnancy	<p>Adequacy of total weight gained during pregnancy, using pre-pregnancy BMI based on the birth certificate, was based on the National Academies of Science, Engineering and Medicine guidelines and</p>	<p>2016-2018 for current definition; 2010-2015 for previous definition.</p>	<p>Prior to 2016, pre-pregnancy BMI was calculated with the same method using <i>self-reported</i> weight and height from the MIHA survey.</p>	<p>Starting in 2016, the indicator is not comparable with prior years.</p>

Indicator	Definition	Years Available	Change in Definition	Comparability
	<p>restricted to women who delivered at 37-42 weeks gestation, singletons and twins, prenatal weight gain within 0-97 pounds, height within 48-83 inches, pre-pregnancy weight within 75-399 pounds and BMI values within 13-69.99. See National Academies of Science, Engineering guidelines for more detail.</p> <p><i>BMI may overestimate or underestimate body fatness in some individuals since it does not take into consideration an individual's muscle or bone mass. The clinical correlation of BMI has not been validated in some subpopulations; therefore, BMI should not be used as the sole criteria for making health recommendations.</i></p>			
Excessive weight gain during pregnancy	Adequacy of total weight gained during pregnancy, using pre-pregnancy BMI based on the birth certificate, was based on the National Academies of Science, Engineering and	2016-2018 for current definition; 2010-2015 for previous definition.	Prior to 2016, pre-pregnancy BMI was calculated with the same method using <i>self-reported</i> weight and	Starting in 2016, the indicator is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
	<p>Medicine guidelines and restricted to women who delivered at 37-42 weeks gestation, singletons and twins, prenatal weight gain within 0-97 pounds, height within 48-83 inches, pre-pregnancy weight within 75-399 pounds and BMI values within 13-69.99. See National Academies of Science, Engineering guidelines for more detail.</p> <p><i>BMI may overestimate or underestimate body fatness in some individuals since it does not take into consideration an individual's muscle or bone mass. The clinical correlation of BMI has not been validated in some subpopulations; therefore, BMI should not be used as the sole criteria for making health recommendations.</i></p>		height from the MIHA survey.	
Food insecurity during pregnancy	Calculated from the modified U.S. Department of Agriculture (USDA) Food Security Module Six-Item Short Form and categorized as food secure (0-	2010-2018	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
	1) or food insecure (2-6). Responses with one or two missing values were imputed. See USDA guidelines for more detail.			

Intimate Partner Violence (IPV) and Depressive Symptoms

Indicator	Definition	Years Available	Change in Definition	Comparability
Physical IPV in the year before pregnancy	During the 12 months before pregnancy, respondent was pushed, hit, slapped, kicked, choked or physically hurt in any way by current or former partner.	2010-2011	---	---
Physical or psychological IPV during pregnancy	During pregnancy, experienced any of the following: pushed, hit, slapped, kicked, choked or physically hurt in any way by current or former partner; frightened for safety of self, family or friends because of current or former partner's anger/threats; current or former partner tried to control most/all daily activities.	2012-2016	Prior to 2012, IPV indicator measured physical IPV in the year before pregnancy; starting in 2017, psychological IPV was added.	The physical or psychological IPV during pregnancy indicator is not comparable to the physical IPV before pregnancy nor the physical, psychological, or sexual IPV during pregnancy indicators.

Indicator	Definition	Years Available	Change in Definition	Comparability
Physical, psychological, or sexual IPV during pregnancy	During pregnancy, experienced any of the following: pushed, hit, slapped, kicked, choked or physically hurt in any way by current or former partner; frightened for safety of self, family or friends because of current or former partner's anger/threats; current or former partner tried to control most/all daily activities; forced into any type of unwanted sexual activity by current or former partner.	2017-2018	Prior to 2017, IPV indicator measured physical or psychological IPV during pregnancy; starting in 2017, sexual IPV was added.	In 2017, replaced previous <i>Physical or psychological IPV during pregnancy</i> indicator and is not comparable with prior indicators.
Prenatal depressive symptoms (previous)	During pregnancy, experienced both of the following for two weeks or longer: felt sad, empty or depressed for most of the day; lost interest in most things she usually enjoyed.	2010-2015	---	---
Prenatal depressive symptoms	During pregnancy, always or often: felt down, depressed or hopeless, <i>or</i> had little interest or pleasure in doing things usually enjoyed.	2016-2018	Prior to 2016, the indicator was based on a different set of questions and defined as during pregnancy, experienced both of the following for two weeks or longer: felt sad, empty or depressed for	In 2016, replaced the previous prenatal depressive symptoms indicator and is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
			most of the day; lost interest in most things she usually enjoyed.	
Postpartum depressive symptoms (previous)	Since most recent birth, experienced both of the following for two weeks or longer: felt sad, empty or depressed for most of the day; lost interest in most things she usually enjoyed.	2010-2015	---	---
Postpartum depressive symptoms	Since most recent birth, always or often: felt down, depressed or hopeless, <i>or</i> had little interest or pleasure in doing things usually enjoyed.	2016-2018	Prior to 2016, the indicator was based on a different set of questions and defined as since most recent birth, experienced both of the following for two weeks or longer: felt sad, empty or depressed for most of the day; lost interest in most things she usually enjoyed.	In 2016, replaced previous postpartum depressive symptoms indicator and is not comparable with prior years.

Hardships and Support During Pregnancy

Indicator	Definition	Years Available	Change in Definition	Comparability
Experienced two or more hardships during childhood	Composite indicator measuring two or more hardships	2011-2015	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
	<p>experienced during the woman's childhood (from birth through age 13). Hardships included: a parent or guardian she lived with got divorced or separated; she moved because of problems paying the rent or mortgage; someone in her family went hungry because family could not afford enough food; her parent or guardian got in trouble with the law or went to jail; a parent or guardian she lived with had a serious drinking or drug problem; she was in foster care (removed from her home by the court or child welfare agency), and very often or somewhat often her family experienced difficulty paying for basic needs like food or housing.</p>			
Had a lot of unpaid bills	During pregnancy, had a lot of bills she couldn't pay.	2010	---	---
Homeless or did not have a regular place to sleep	During pregnancy, did not have a regular place to sleep at night (moved from house to house)	2011-2018	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
	or was homeless (had to sleep outside, in a car or in a shelter).			
Moved	During pregnancy, moved to a new address for any reason.	2010	---	---
Moved due to problems paying rent or mortgage	During pregnancy, had to move because of problems paying the rent or mortgage.	2011-2018	Prior to 2011, indicator measured whether a woman moved to a new address for any reason.	In 2011, replaced previous <i>Moved</i> indicator and is not comparable with prior years.
Woman or partner lost job	During pregnancy, lost job even though wanted to go on working, or husband or partner lost their job.	2010-2018	---	---
Woman or partner had pay or hours cut back	During pregnancy, had pay or hours cut back, or partner had pay or hours cut back.	2011-2018	---	---
Became separated or divorced	During pregnancy, became separated or divorced from partner.	2010-2018	---	---
Had no practical or emotional support	During pregnancy, had neither someone to turn to for practical help, like getting a ride somewhere, or help with shopping or cooking a meal; nor someone to turn to if she	2010-2018	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
	needed someone to comfort or listen to her.			
Often experienced racism over her lifetime	During lifetime, very or somewhat often has been discriminated against, prevented from doing something or hassled or made to feel inferior because of race, ethnicity or color.	2016-2018	---	---

Substance Use

Indicator	Definition	Years Available	Change in Definition	Comparability
Any smoking, 3 months before pregnancy	During the three months before pregnancy, smoked any cigarettes on an average day.	2010-2018	---	---
Any smoking, 1st or 3rd trimester	During the first or last three months of pregnancy, smoked any cigarettes on an average day.	2011-2012 for current definition; 2010 for previous definition.	In 2011, the following phrase in italics was added to the question on smoking during the first trimester of pregnancy: "During the first 3 months of your pregnancy (<i>including before you knew you were pregnant for sure</i>), how many cigarettes or packs of cigarettes did you smoke on an	Starting in 2011, the indicator is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
			average day? (A pack has 20 cigarettes.)”	
Any smoking, 3rd trimester	During the last three months of pregnancy, smoked any cigarettes on an average day.	2013-2018	Prior to 2013, this indicator was combined with any smoking during the first trimester.	In 2013, this indicator replaced previous <i>Any smoking, 1st or 3rd trimester</i> indicator and is not comparable to prior years.
Any smoking, postpartum	At the time of the survey, smoked any cigarettes.	2011-2018	---	---
Any binge drinking, 3 months before pregnancy	During the three months before pregnancy, drank four or more alcoholic drinks in one sitting (within about two hours) at least one time.	2010-2018	---	---
Any alcohol use, 1st or 3rd trimester	During the first or last three months of pregnancy, drank any alcoholic drinks in an average week.	2011-2012 for current definition; 2010 for previous definition.	In 2011, the phrase in italics was added to the question on drinking during the first trimester of pregnancy: “During the first 3 months of your pregnancy (<i>including before you knew you were pregnant for sure</i>), about how many drinks	Starting in 2011, the indicator is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
			with alcohol did you have in an average week?"	
Any alcohol use, 3rd trimester	During the last three months of pregnancy, drank any alcoholic drinks in an average week.	2013-2018	Prior to 2013, this indicator was combined with any alcohol use during the first trimester.	In 2013, replaced previous <i>Any alcohol use, 1st or 3rd trimester</i> indicator and is not comparable to prior years.
Any cannabis use during pregnancy	During most recent pregnancy, used marijuana or weed in any way (like smoking, eating or vaping).	2016-2018	---	---

Pregnancy Intention and Family Planning

Indicator	Definition	Years Available	Change in Definition	Comparability
Mistimed or unwanted pregnancy	Just before pregnancy, felt that she did not want to get pregnant then or in the future, or wanted to get pregnant later.	2011-2018	---	Starting in 2011, the indicator is not comparable with the unintended pregnancy indicator from prior years.
Unsure of pregnancy intentions	Just before pregnancy, felt that she was not sure if she wanted to get pregnant.	2011-2018	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
Postpartum birth control use	At the time of the survey, woman or husband/partner was doing something to keep from getting pregnant. Women who were currently pregnant or had a hysterectomy/oophorectomy are excluded from the denominator.	2013-2018 for current definition; 2011-2012 for previous definition.	Prior to 2013, definition excluded from the denominator women who were currently pregnant and women who were not having sex at the time of the survey.	Starting in 2013, the indicator is not comparable with prior years.

Infant Sleep and Breastfeeding

Indicator	Definition	Years Available	Change in Definition	Comparability
Placed infant on back to sleep	Put baby down to sleep on his or her back most of the time. Women whose infant did not reside with them at the time of the survey are excluded from the denominator.	2010-2018	---	---
Infant always or often shared bed	Baby always or often slept in the same bed with her or someone else. Women whose infant did not reside with them at the time of the survey are excluded from the denominator.	2010-2011, 2013-2018	---	Question was not on the survey in 2012.
Intended to breastfeed, before birth	Before delivery, planned to breastfeed only or to breastfeed and use formula.	2010-2018	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
	Women whose infant did not reside with them at the time of the survey are excluded from the denominator.			
Intended to breastfeed exclusively, before birth	Before delivery, planned to breastfeed only. Women whose infant did not reside with them at the time of the survey are excluded from the denominator.	2010-2018	---	---
Any breastfeeding, 1 month after delivery	Fed infant breast milk for at least one month after delivery with or without formula, other liquids or food. Infant age is calculated from date of birth on the birth certificate. Women whose infant did not reside with them at the time of the survey are excluded from the denominator.	2011-2018	The infant feeding questions changed in 2011.	Starting in 2011, the indicator is not comparable with prior years.
Exclusive breastfeeding, 1 month after delivery	Fed infant only breast milk (no supplementation with formula, other liquids or food) for at least one month after delivery. Infant age is calculated from date of birth on the birth certificate. Women whose infant did not reside with them at the time of the survey are	2011-2018	The infant feeding questions changed in 2011.	Starting in 2011, the indicator is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
	excluded from the denominator.			
Any breastfeeding, 3 months after delivery	Fed infant breast milk for at least three months after delivery with or without supplementing with formula, other liquids or food. Infant age is calculated from date of birth on the birth certificate. Women whose infant did not reside with them or whose infant was not yet three months old at the time the respondent completed the survey are excluded from the denominator.	2011-2018	The infant feeding questions changed in 2011.	Starting in 2011, the indicator is not comparable with prior years.
Exclusive breastfeeding, 3 months after delivery	Fed infant only breast milk (no supplementation with formula, other liquids or food) for at least three months after delivery. Infant age is calculated from date of birth on the birth certificate. Women whose infant did not reside with them or whose infant was not yet three months old at the time of the survey are excluded from the denominator.	2011-2018	The infant feeding questions changed in 2011.	Starting in 2011, the indicator is not comparable with prior years.

Health Care Utilization and Public Program Participation

Indicator	Definition	Years Available	Change in Definition	Comparability
Had a usual source of pre-pregnancy care	Just before pregnancy, had a particular doctor, nurse or clinic that she usually went to for health care.	2011-2018	Prior to 2011, the question included the phrase in italics: “Just before you got pregnant <i>for your most recent birth.</i> ”	Starting in 2011, the indicator is not comparable with prior years.
Initiated prenatal care in 1st trimester	Had first prenatal care visit in the first three months or 13 weeks of pregnancy, not counting a visit for just a pregnancy test or a WIC visit.	2012-2018	In 2011, the phrases in italics were added to the questions: “Did you get any prenatal care during your most recent pregnancy? (Please do not count a visit just for a pregnancy test <i>or only for WIC, the Women, Infants and Children supplemental nutrition program.</i>)” and “How many weeks or months pregnant were you when you had your first prenatal care visit? (Please do not count a visit just for a pregnancy test <i>or only for WIC.</i>)” In 2012, the filter question, “Did you get any prenatal care during	Starting in 2012, the indicator is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
			your most recent pregnancy?" was dropped.	
Received dental care during pregnancy	During pregnancy, visited a dentist, dental clinic or got dental care at a health clinic.	2012, 2015-2018	---	This indicator was reported as "had a dental visit during pregnancy" in 2009 and 2012 and is comparable to this indicator. Question was not on the survey 2013-2014.
Received a Tdap vaccine during pregnancy	During most recent pregnancy, received a Tdap vaccination or shot.	2016-2018	---	---
Received a flu shot during pregnancy	During most recent pregnancy, had a flu shot.	2016-2018	---	---
Had a postpartum medical visit	Had a postpartum check-up for herself (the medical check-up 4-6 weeks after a woman gives birth).	2011-2018	---	---
Mom or infant needed but couldn't afford care postpartum	Since her most recent birth, there was a time when she needed to see a doctor or nurse for her own medical care or for her infant but did not go	2010-2015	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
	because she could not afford to pay for it.			
WIC status during pregnancy Statewide Snapshots subgroup (WIC products only)	WIC is the Special Supplemental Nutrition Program for Women, Infants and Children. WIC status during pregnancy was categorized as prenatal WIC participant, eligible nonparticipant or ineligible for WIC. Prenatal WIC participants were women who self-reported in MIHA that they were on WIC at any time during their most recent pregnancy. Eligibility for WIC nonparticipants is based on insurance for prenatal care or delivery on the birth certificate and self-reported income in MIHA. Those not on WIC during pregnancy were categorized as WIC eligible nonparticipants if the birth certificate indicated they had Medi-Cal for prenatal care or delivery, or if they self-reported income at or below 185% of the Federal Poverty Guidelines (FPG). Respondents were categorized as ineligible	2013-2014, 2016-2018	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
	for WIC if the birth certificate indicated another source or no insurance for prenatal care or delivery, and self-reported income above 185% FPG.			
Participated in WIC during pregnancy	WIC is the Special Supplemental Nutrition Program for Women, Infants and Children. Participation in WIC during pregnancy is based on self-report on the MIHA survey.	2010, 2013-2018 for current definition; 2012 for previous definition.	In 2012, participation in WIC during pregnancy was based on WIC client records obtained from WIC Management Information System (WIC MIS) and linked to the MIHA survey.	This indicator was not published for 2011.
Received CalFresh (food stamps) during pregnancy	CalFresh, formerly known as food stamps, is the California Supplemental Nutrition Assistance Program.	2011-2018	Prior to 2011, the question did not include the phrase “(also called CalFresh benefits)”.	Starting in 2011, the indicator is not comparable with prior years.

Health Insurance Coverage

Indicator	Definition	Years Available	Change in Definition	Comparability
Pre-pregnancy/postpartum insurance	During the month before pregnancy/at the time of the survey, had Medi-Cal or a health plan paid for by Medi-Cal; private insurance through her or her husband’s/partner’s job, her	2011-2018 for current definition; 2010 for previous definition.	Starting in 2011, women with “Other” insurance, such as military, Indian Health Service, Medicare or international, are not shown; the 2010	Starting in 2011, the indicator is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
	<p>parents or purchased directly; or was uninsured. Women with both Medi-Cal and private insurance were categorized as Medi-Cal.</p>		<p>indicator combined the “Other” and “Private” insurance categories; and women were asked to provide the name of their health insurance plan, which was used to categorize insurance with greater precision.</p>	
<p>Prenatal insurance</p>	<p>During pregnancy had one of the following to pay for prenatal care: Medi-Cal or a health plan paid for by Medi-Cal; private insurance through her or her husband’s/partner’s job, her parents or purchased directly; or was uninsured. Women with both Medi-Cal and private insurance are categorized as Medi-Cal.</p>	<p>2011-2018 for current definition; 2010 for previous definition.</p>	<p>Starting in 2011, women with “Other” insurance, such as military, Indian Health Service, Medicare or international, are not shown; the 2010 indicator combined the “Other” and “Private” insurance categories; and the prenatal insurance question changed in order to distinguish between Medi-Cal and a plan paid for by Medi-Cal, as well as to identify how women obtained private insurance. Women also were asked</p>	<p>Starting in 2011, the indicator is not comparable with prior years.</p>

Indicator	Definition	Years Available	Change in Definition	Comparability
			to provide the name of their health insurance plan, which was used to categorize insurance with greater precision.	
Had any gaps in insurance during pregnancy	During pregnancy, had no health insurance plan at all to pay for prenatal care or had one or more periods without health insurance coverage.	2016-2018	---	---
Infant health insurance	Infant had Medi-Cal or a health plan paid for by Medi-Cal; private insurance through parent’s job or purchased directly; or was uninsured.	2011-2018 for current definition; 2010 for previous definition.	Starting in 2011, infants with “Other” insurance, such as military, California Children’s Services, Indian Health Service or Medicare, are not shown; the 2010 indicator combined the “Other” and “Private” insurance categories; and women were asked to provide the name of their infant’s health insurance plan, which was used to categorize insurance with greater precision. Women whose infant did not reside with them at the	Starting in 2011, the indicator is not comparable with prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
			time of the survey are excluded from the denominator.	

Maternal Demographics

Indicator	Definition	Years Available	Change in Definition	Comparability
First live birth	Recent birth is the first live birth delivered by the mother, reported on the birth certificate.	2010-2018	---	---
Total Live Births (Statewide Snapshots subgroup)	The number of live births the mother delivered as reported on the birth certificate. If the most recent delivery was twins or triplets, only the first baby born is included in the count and is considered one birth. For prior multiple births each baby is counted separately.	2010-2018	---	---
Age	Age of mother at time of birth, reported on the birth certificate.	2010-2018	---	---
Less than high school education (or GED)	At the time of the survey, had completed no school; 8th grade or less; or some high school, but did not graduate.	2010-2018	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
Unmarried	At the time of birth, was single (never married); separated, divorced or widowed; or was living with someone like they were married, but not legally married.	2010-2018	---	---
Married or living together as married	At the time of birth, was married or was living with someone like they were married, but not legally married.	2010-2018	---	---
Race/Ethnicity	Mother's Hispanic origin and the first race listed on the birth certificate.	2010-2018	---	---
Born outside the U.S.	Mother's place of birth not in the U.S., reported on the birth certificate.	2010-2018	---	---
Speaks non-English language at home	Usually speaks Spanish or an Asian or other language at home (if more than one language spoken, the one used most often; women who speak English and Spanish equally are not included in this group).	2010-2018	---	---

Indicator	Definition	Years Available	Change in Definition	Comparability
Neighborhood Poverty (Statewide Snapshots subgroup)	The percentage of residents living below the federal poverty threshold in a given neighborhood, as defined by census tract of the residence, reported on the birth certificate. The estimated percentage of residents below poverty by census tract is obtained from American Community Survey 5-year estimates from the most recent year. Birth certificate and American Community Survey data are linked. Categories are defined as: Low (<10% of residents below poverty), moderate-low (10-19% of residents below poverty), moderate-high (20-29% of residents below poverty) and high (≥ 30% of residents below poverty).	2016-2018 for current definition; 2013-2015 for previous definition.	Prior to 2016, categories for level of neighborhood poverty were defined as: 0-4.9%, 5-9.9%, 10-19.9% and ≥20%.	Starting in 2016, subgroups are not comparable to prior years.
Lives in a high poverty neighborhood	Lives in a neighborhood, as defined by census tract of the residence reported on the birth certificate, in which 30% or more of residents are living below the federal poverty	2016-2018 for current definition; 2013-2015 for previous definition.	Prior to 2016, high poverty neighborhood was defined as 20% or more of residents living below the federal poverty threshold.	Starting in 2016, indicator is not comparable to prior years.

Indicator	Definition	Years Available	Change in Definition	Comparability
	<p>threshold. The estimated percentage of residents below poverty by census tract is obtained from American Community Survey 5-year estimates from the most recent year. Birth certificate and American Community Survey data are linked.</p>			
<p>Income as a percent of the Federal Poverty Guideline (FPG)</p>	<p>Calculated from monthly family income, before taxes from all sources, including jobs, welfare, disability, unemployment, child support, interest, dividends and support from family members, and the number of people living on that income.</p> <p>See the annual Poverty Guidelines published by the U.S. Department of Health and Human Services for more detail.</p>	<p>2010-2018</p>	<p>For WIC products only: In 2016, indicator categories in the WIC Snapshots changed from 0-100% FPG, 101-200% FPG and >200% FPG to 0-100% FPG, 101-185% FPG and >185% FPG.</p>	<p>For WIC products only: Starting in 2016, 101-185% FPG and >185% FPG categories are not comparable to the 2013-2014 WIC Snapshots.</p>
<p>Geographical Area (Statewide Snapshots subgroup)</p>	<p>Urban and rural/frontier designations are based on the population size or densities of Medical Service Study Areas (MSSAs). MSSAs are sub-county geographic units</p>	<p>2013-2018</p>	<p>---</p>	<p>---</p>

Indicator	Definition	Years Available	Change in Definition	Comparability
	<p>composed of one or more census tracts. Women are classified as living in an urban area if their MSSA ranges in population from 75,000 to 125,000; a rural area if their MSSA has a population density of less than 250 persons per square mile and a frontier area if their MSSA has a population density of less than 11 persons per square mile. Women's MSSA is based on the residence reported on the birth certificate.</p> <p>See the California Department of Health Care Access and Information (HCAI) for more detail on MSSAs.</p>			

MIHA County-Level Data Availability, 2016-2018

Maternal and Infant Health Assessment (MIHA) Survey



Top 35 Birthing Counties

Percentage of California resident women with a live birth in 2016-2018

Los Angeles	24.7%	Kern	2.8%	Santa Barbara	1.2%	Kings	0.5%
San Diego	8.8%	Contra Costa	2.6%	Solano	1.1%	Yolo	0.5%
Orange	7.9%	San Joaquin	2.1%	Sonoma	1.0%	Marin	0.5%
San Bernardino ...	6.3%	Ventura	2.0%	Merced	0.9%	Madera	0.5%
Riverside	6.3%	San Francisco	1.9%	Placer	0.8%	Shasta	0.4%
Santa Clara	4.7%	San Mateo	1.8%	Imperial	0.6%	El Dorado	0.3%
Sacramento	4.1%	Stanislaus	1.6%	Santa Cruz	0.6%	Humboldt	0.3%
Alameda	4.0%	Tulare	1.5%	San Luis Obispo ...	0.5%	Napa	0.3%
Fresno	3.1%	Monterey	1.3%	Butte	0.5%		

Data Source: 2016-2017 Birth Statistical Master File and 2018 California Comprehensive Master Birth File.

Prepared by: Maternal, Child and Adolescent Health Division, Center for Family Health, California Department of Public Health.

MIHA Regions of California, 2016-2018

Maternal and Infant Health Assessment (MIHA) Survey



Data Annotation and Suppression Criteria

The current MIHA data suppression criteria require estimates to be suppressed when:

- the sample numerator is less than 5,
- the number of women in the population of interest (population denominator) is less than 100,
- the relative standard error (RSE) is greater than 50%, or
- a measure has been determined to address a sensitive topic and the prevalence is greater than 80% and the unweighted population divided by the weighted population is greater than 50%.

Additionally, estimates are annotated and users are warned to interpret with caution if the RSE is between 30% and 50%. The RSE is a commonly used measure of reliability, or precision, of survey estimates and is calculated using the following formulas:

For estimates with a prevalence $\leq 50\%$:

$$\text{Standard error} \div \text{estimate}$$

For estimates with a prevalence $> 50\%$:

$$\text{Standard error} \div (1 - \text{estimate})$$

Some MIHA publications using data from 2010-2012 used a previous set of suppression criteria in which estimates were suppressed when the number of events (sample numerator) was less than 10.

Weighting Methods

Sampling weights are created in MIHA to account for the stratified design, oversampling of specific groups, non-response among the women sampled and non-coverage of women who could not be sampled because their births were not in the sampling frame. When the final MIHA sample is weighted each year, it is designed to be representative of all mothers who delivered live-born infants in California during the calendar year in which the survey was conducted and who met other criteria, including mothers who were California residents, at least 15 years of age and had a singleton, twin or triplet birth. Although MIHA data are weighted to the entire birthing population, minus exclusions, the survey is only administered in English and Spanish and results may not be generalizable to women who speak other languages. The population represented by MIHA is referred to as the “target” population and is defined using the annual birth file, which is the final compilation of California birth data released annually by the Center for Health Statistics and Informatics (CHSI). From 1999 to 2017, this file was the Birth Statistical Master File (BSMF) and starting in 2018, it is the California Comprehensive Master Birth File (CCMBF).

The MIHA survey design allows for oversampling of certain groups, meaning their probabilities of selection were greater than the proportions of births they represented in the state. This ensures that enough respondents participate in the survey to allow for analysis. These oversamples have included American Indian/Alaska Native women (2012-2015), Black women (all years), WIC-eligible women not participating in the WIC program (2010-2012), women with a preterm birth (2016 and later), the 20 counties with the most births (2010-2012) and the 35 counties with the most births (2013 to present).

Every woman who responded to MIHA is assigned a survey weight, which indicates the number of mothers in California like herself that she represents. Starting in 2010, this State Weight has consisted of 4 components (see below) calculated within strata. Additional steps have been added in subsequent years to create a Final Weight and improve the ability of the sample to represent the target population. Starting in 2011, raking (see details below) was added to the weighting process to adjust the State Weights to more accurately represent the annual birth file, particularly at the county level. Starting in 2013, trimming of weights (see details below) was implemented to reduce the influence of excessively large survey weights. These methods of raking and trimming continue to be used in all MIHA publications since 2013.

Calculation of the State Weight

The components of the State Weight are as follows:

Non-Coverage Weight

The non-coverage weight accounts for differences between the frame from which the sample is drawn and the target population to which generalizations are made. The MIHA sample is drawn from birth certificate data for births occurring from February through May of each year, which is referred to as the “sampling frame.” Birth certificate data files from which the MIHA sample is drawn are provided in monthly batches by the CHSI. The non-coverage weight accounts for the difference between the number of births in the sampling frame and the number in the calendar

year. The non-coverage weight also accounts for changes that might be made to the birth file after the sample is taken (e.g., births may not be in the frame files for sampling if they are reported late, but these late reported births are eventually included in the annual birth file). The non-coverage weight is defined, within stratum S , as:

$$\text{Number in the Target Population }_s \div \text{Number in the Sampling Frame }_s$$

Inverse of Sampling Fraction

The sampling fraction is the probability of selection, or the ratio of the number of women sampled to the number of women in the sampling frame. Therefore, the inverse of the sampling fraction within stratum S is:

$$\text{Number in the Sampling Frame }_s \div \text{Number Sampled }_s$$

Non-Response Weight

This weight adjusts for non-response to the survey by women who were sampled. The non-response weight is calculated within stratum S as:

$$\text{Number Sampled }_s \div \text{Number of Respondents }_s$$

Post-stratification Weight for Non-response (Propensity Score Adjustment)

The non-response weight described above accounts for non-response on factors used to define the strata (e.g., Black race, term or preterm birth and county/region of residence). Additional individual-level factors may also predict whether a woman is likely to respond to the MIHA survey. Therefore, another adjustment for non-response is calculated to make the MIHA survey more representative of the target population from which the sample is taken. The probability of responding (versus not responding) is calculated using a geographically stratified logistic regression model of all sampled women. Variables in the logistic regression model come from the annual birth file and include maternal race/ethnicity, US or foreign birthplace, age, education, reported principal source of delivery payment, total children born alive, month prenatal care began, WIC participation, and term or preterm birth. A predicted probability (p) of being a respondent, or propensity score, is output for every woman sampled. The score is then rescaled, which means that p is multiplied by a constant factor for all respondents, so that the sum of p over all respondents now adds to the number of respondents.

Starting in 2014, the post-stratification weight is capped at the 99th percentile of the post-stratification weight for each year.

Formula for State Weight

The State Weight is calculated using the four components defined above:

$$\text{NON-COVERAGE} * \text{INVERSE SAMPLING FRACTION} * \text{NON-RESPONSE} * \text{POST-STRATIFICATION}$$

Adjustments to Create the Final Weight

Raking Survey Weights (or Iterative Proportional Fitting)

Raking is a process by which the weighted prevalence of a selected variable is aligned with the known prevalence in a target population. In MIHA, the State Weights are raked so that weighted birth certificate variable estimates reflect those of the annual birth file as closely as possible at the level of the respondent's sampling region (county or group of counties). Raking is conducted over a series of predetermined variables, one at a time, in an iterative process. Raking variables include maternal age, race/ethnicity, nativity, prior cesarean section (2010-2012), low birth weight, preterm birth, prior live births, delivery payer, delivery method, BMI before pregnancy (2013-2018), education (2013-2018) and WIC participation (2017-2018). The weight assigned to each woman who falls in category *C* of raking variable *V* is multiplied by a factor of:

$$\text{Number in the Target Population } vc \div \text{Weighted Number of MIHA Respondents } vc$$

The first adjustment is made to the State Weight calculated in the previous section. This results in a different weight value, which is adjusted using the next raking variable and the process continues for each variable. After this is done for all desired variables, the data are checked to ensure the percentages for each raking variable are as close as possible to those of the annual birth file within the sampling region or group. If results can be adjusted to be more similar to those of the annual birth file, the process starts again with the first raking variable, using the weight from the previous iteration.

After the raking process is complete, the resulting weight is rescaled (i.e., multiplied by a constant factor), so that the sum of the raked weights over all respondents adds to the number of women in the annual birth file who meet MIHA's inclusion criteria in that county/region.

Rationale for Raking

Before raking was introduced, the prior weighting method produced weighted data that were very close to the data from the annual birth file at the state level and for most counties/regions. However, there were some remaining discrepancies between the weighted MIHA data and the annual birth file within subgroups of women and at the county and regional levels. Raking the State Weights produces estimates that are closer to those of the annual birth file for subgroups, and at the county and regional level.

Trimming Survey Weights

MIHA weights are trimmed to reduce the influence of excessively high individual weights. Trimming is the process by which survey weights are reset to a predetermined upper limit, which reduces the occurrence of uniquely high weights that may skew survey results. To trim survey weights, a standardized distance is calculated for weights within each stratum. Strata with weights with excessive (>99th percentile) distances are identified, and weights within those strata are trimmed at the third standard deviation (99.73rd percentile) of weights, which are constrained to a fixed range of the original State Weight. Weights are rescaled so that totals reflect population totals in the annual birth file.

After raking and trimming, differences between county-level and regional-level MIHA data and the annual birth file are small. Very few of the estimates in the largest 35 counties are greater than three percentage points different from those in the annual birth file after raking. After trimming, the median difference between the weighted/trimmed MIHA value and the annual birth file in 2017 for raking variables was 0.00%, and 89% of estimates were within one percentage point of the birth file value. Differences between MIHA and the target population are sometimes greater in the smaller sampling regions, such as San Benito County, than in the counties that have more births.

Comparability across Years

Updated weighting methods have been retroactively applied to datasets starting with the year 2010. MIHA publications for 2010-2012 that were produced using earlier methods (i.e., without the raking or trimming steps) have not been updated using the new weights, but all analyses published after 2013 have applied the raked and trimmed weights for 2010 MIHA data onward. The difference between the estimates using the old and new weighting methods is small. Therefore, users may compare estimates across MIHA data years and publications, in spite of the changes to the weighting methods, unless specific changes in indicators are otherwise noted.