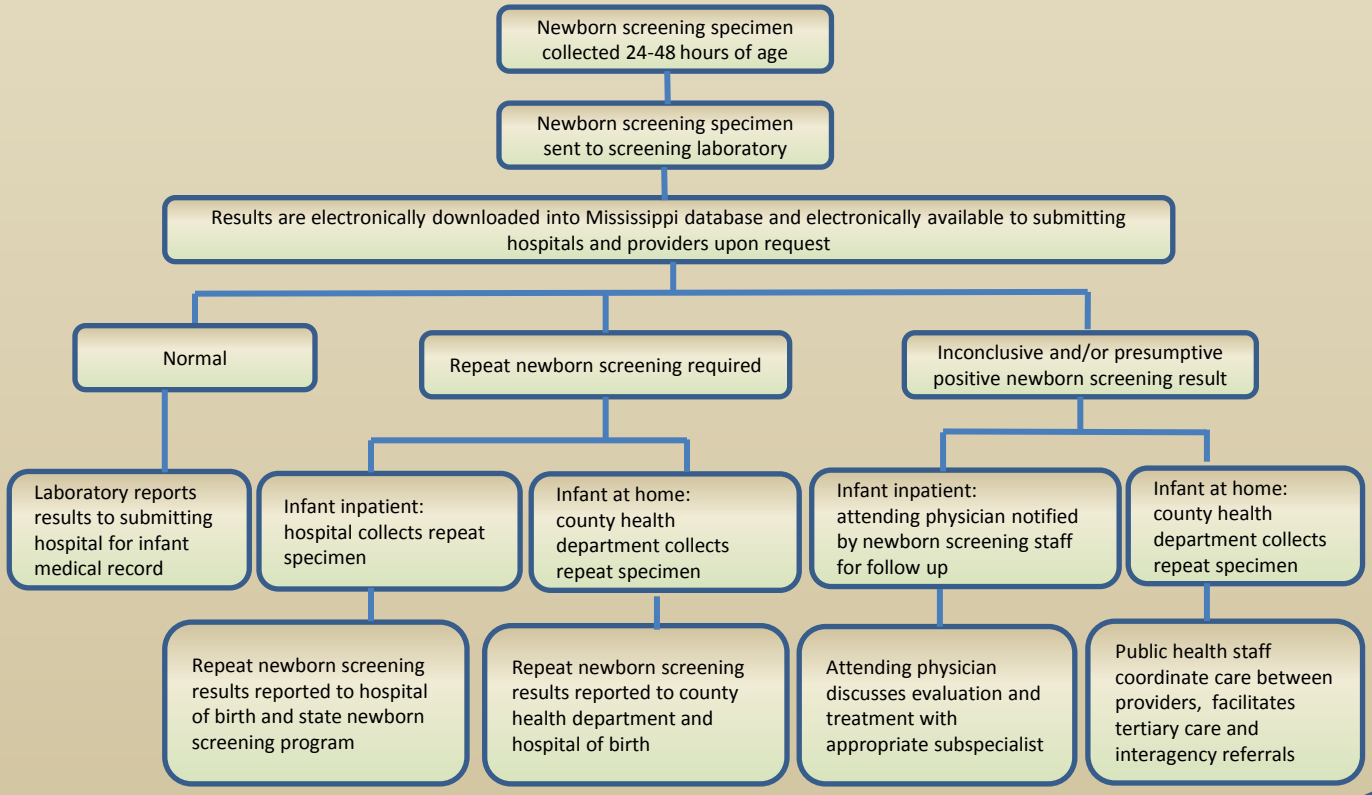
Mississippi Newborn Screening Report 2009-2014

Introduction

The primary goal of the Newborn Screening Program is to screen every infant born in the state and refer infants with abnormal results to appropriate centers for medical evaluation, confirmatory testing, and initiation of medical and/or nutritional treatment if indicated. The newborn screening system includes birthing hospitals, screening laboratory, public health staff, and tertiary care centers. The program is housed in the MSDH Health Services' Office of Child and Adolescent Health in the Bureau of Genetic Services. It screens a wide range of genetic disorders including:

- Amino Acid Disorders
- Organic Acid Disorders
- Fatty Acid Oxidation Disorders
- Biotinidase Deficiency
- Hypothyroidism
- Congenital Adrenal Hypoplasia
- Cystic Fibrosis
- Galactosemia
- Hemoglobinopathies
- SCID

Mississippi Newborn Screening Program Flow Chart



Mississippi Births, Number and Percentage of Newborn Screened, 2009-2014

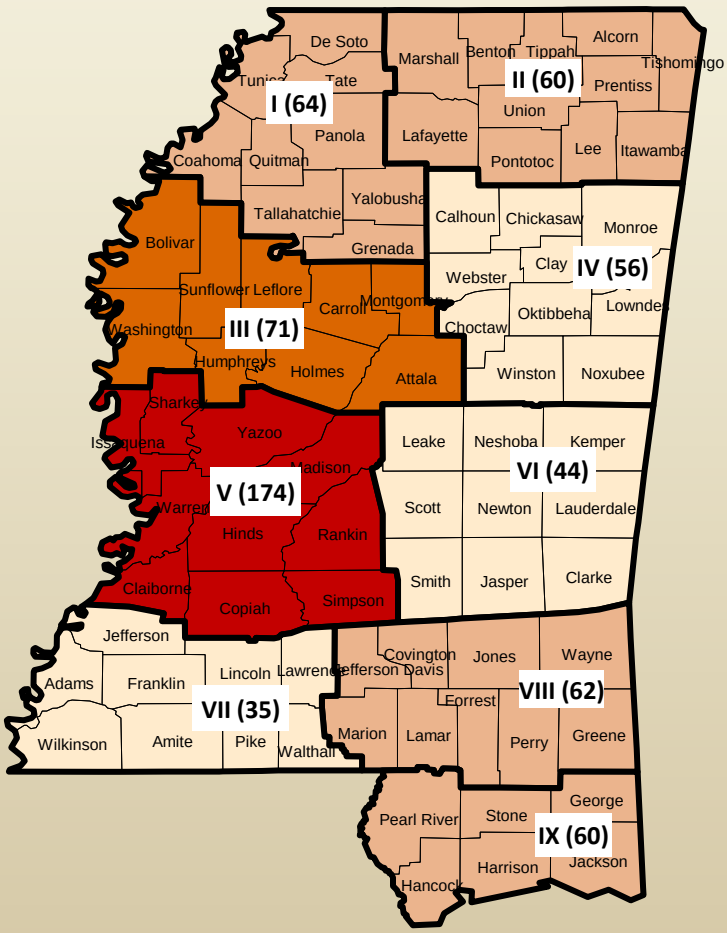
Through the collaboration of all stakeholders in the newborn screening process, almost all infants born in Mississippi are screened each year. Newborns may not have been screened due to transferring out of state for a higher level of care shortly after birth, death prior to specimen collection or other exception.

	2009	2010	2011	2012	2013	2014
Mississippi Births	41,975	39,177	38,939	37,787	37,648	37,956
Number of Newborns Screened	41,858	39,055	38,857	37,657	37,524	37,828
Percentage of Newborns Screened	99.7%	99.7%	99.8%	99.7%	99.7%	99.7%

The Number of Newborns with Confirmed Genetic Disorders/Diseases by Mississippi Public Health District, 2009-2014

The map displays the number of infants with confirmed disorders or diseases over a six-year period (2009-2014) according to their residence within the nine public health districts in Mississippi.

In 2009 – 2014, 626 newborns with genetic disorders or diseases were found in Mississippi. The districts with higher numbers of newborns with confirmed genetic disorders or diseases were Districts V and III. District V has the highest population concentration in the state, and it may explain its higher number of disorders or diseases. District III has an overall lower population, however, it has the largest percentage of African Americans, who are at greater risk of Hemoglobinopathy disorders (HGBD), the largest group of disorders in Mississippi.



Data Source: Mississippi Newborn Screening Program Database

Mississippi Confirmed Disorders/Diseases, 2009 – 2014*

Over the six-year period in Mississippi, 99.7% of newborns screened had normal results. A total of 640 newborns with disorders or diseases were confirmed. Among them, 410 or 64% were hemoglobinopathy disorders.

Amino Acid Disorders	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Total**
Hypermethioninemia	0	3	0	0	0	0	3
Maple Syrup Urine Disease	1	0	0	0	0	0	1
Phenylketonuria	0	1	2	1	1	2	7
Tyrosinemia	1	0	0	0	0	0	1
Total	**2**	**4**	**2**	**1**	**1**	**2**	**12**
Organic Acid Disorders	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Total**
3-methylcrotonyl-Coa Carboxylase Deficiency	0	2	0	0	1	1	4
Glutaric Aciduria Type I	0	1	0	0	1	0	2
Isovaleric Acidemia	1	0	1	0	0	0	2
Propionic Acidemia	0	2	0	0	0	0	2
Total	**1**	**5**	**1**	**0**	**2**	**1**	**10**
Fatty Acid Oxidation Disorders	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Total**
Carnitine Palmitoryltransferase II	0	0	1	0	0	0	1
Long-chain L-3 hydroxyacyl-CoA dehyrogenase deficiency	0	0	0	1	0	0	1
Medium-Chain Acyl-CoA Dehydrogenase Deficiency	0	5	2	1	2	0	10
Short-Chain Acyl-CoA Dehydrogenase Deficiency	1	3	1	0	3	0	8
Very Long-Chain Acyl-CoA Dehydrogenase Deficiency	0	0	0	0	0	1	1
Total	**1**	**8**	**4**	**2**	**5**	**1**	**21**
General Disorders	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Total**
Biotinidase Deficiency	2	4	3	1	5	1	16
Hypothyroidism	12	14	23	12	15	12	88
Congenital Adrenal Hypoplasia (Included CAH-SW)	0	2	2	5	3	3	15
Cystic Fibrosis	7	9	7	9	6	8	46
Galactosemia	1	3	1	3	1	3	12
Hemoglobinopathies (HGBD)	80	60	71	60	65	74	410
Total	**102**	**92**	**107**	**90**	**95**	**101**	**587**
Severe Combined Immunodeficiency (SCID) / Others	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Total**
SCID	0	0	0	0	1	2	3
Congenital Hypoparathyroidism & DiGeorge Syndrome	0	0	0	0	1	0	1
DiGeorge Syndrome	0	0	0	0	1	3	4
DiGeorge Velocardiofocial Syndrome	0	0	0	1	0	0	1
Partial Di-George Syndrome	0	0	0	0	0	1	1
Total	**0**	**0**	**0**	**1**	**3**	**6**	**10**
Grand Total	**106**	**109**	**114**	**94**	**106**	**111**	**640**

*** This does not include hemoglobinopathy traits**

Hemoglobinopathy Disorders (HGBD) Identified through Newborn Screening in Mississippi, 2009-2014

HGBD is a group of blood disorders or diseases that affect red blood cells. These disorders include both sickle cell disease and thalassemia.

During the six-year period (2009-2014) in Mississippi, 410 HGBD cases were confirmed , which represented the largest group of genetic disorders or diseases identified through newborn screening. Among them, 99% were African Americans and 1% were whites. The incidence of HGBD for African American in Mississippi was 3.9 per 1,000 screened African-American newborns.

Disorders	2009	2010	2011	2012	2013	2014	Total
Hemoglobin Sickle Cell Anemia	38	31	36	30	37	34	206
Hemoglobin FS + Barts	0	0	1	4	2	6	13
Hemoglobin Sickle "C " Disease	0	1	0	1	0	0	2
Hemoglobin S/ Beta + Thalassemia	12	4	6	1	3	5	31
Hemoglobin S/Beta o Thalessemia	0	4	1	2	0	0	7
Hemoglobin Sickle C Disease (FSC)	25	15	19	17	18	22	116
Hemoglobin Sickle "C" Disease+Barts	1	0	0	0	0	0	1
Hemoglobin C/ Beta + Thalassemia	1	0	0	0	1	1	3
Hemoglobin C/Beta o Thalassemia	0	0	0	0	0	0	0
Hemoglobin B/Thal	0	0	0	0	0	0	0
Hemoglobin ASF + Other Hemoglobin	0	0	1	0	0	0	1
Hemoglobin Beta Thalassemia Intermedia	1	0	0	0	0	0	1
Hemoglobin C Disease	1	4	3	4	2	3	17
Hemoglobin E Disease + Barts	1	0	0	0	0	0	1
Hemoglobin F only/disease	0	0	0	1	0	0	1
Hemoglobin FCA	0	0	1	0	0	0	1
Hemoglobin FSA	0	0	0	0	1	3	4
Hemoglobin SC Disease + Barts	0	0	3	0	0	0	3
Hemoglobin S/HPFH	0	1	0	0	0	0	1
Hemoglobin SD Disease	0	0	0	0	1	0	1
Total	**80**	**60**	**71**	**60**	**65**	**74**	**410**

Hemoglobinopathy Traits (HGBT) detected through Newborn Screening in Mississippi, 2009-2014

HGBT is commonly known as sickle cell trait, hemoglobinopathy trait results when a baby receives a gene for hemoglobin A from one parent and a gene for a different hemoglobin type (S, C, or D) from the other parent.

During the six-year period (2009-2014) in Mississippi, 11,284 HGBT cases were found. The incidence of HGBT was 48.5 per 1,000 screened newborns overall; 101 per 1,000 screened African American newborns; 5 per 1,000 screened white newborns.

Trait	2009	2010	2011	2012	2013	2014	Total
Hemoglobin S Trait	1,468	1,326	1,358	1,324	1,237	1,246	7,959
Hemoglobin FAS Trait+BART	69	87	87	79	80	61	463
Hemoglobin FAS + Fast	0	0	0	0	1	0	1
Hemoglobin FAVBAR	0	0	0	1	1	0	2
Hemoglobin AS Trait+ Variant	0	1	0	0	0	0	1
Hemoglobin C Trait	464	401	432	392	366	379	2,434
Hemoglobin FAC Trait+BART	34	40	23	21	19	23	160
Hemoglobin D Trait	7	14	7	16	20	19	83
Hemoglobin D Los Angeles Trait	0	0	6	2	0	0	8
Hemoglobin D or G Trait	2	0	0	0	0	0	2
Hemoglobin AD or AG Trait	3	15	7	10	7	4	46
Hemoglobin AD or AG w/some F	0	0	2	0	0	0	2
Hemoglobin ADF or Hb AGF Tra	0	1	11	6	5	1	24
Hemoglobin AG or AD T+ Fast	1	0	0	0	0	0	1
A + Fast Hemoglobin	0	0	0	1	0	0	1
AF + Fast Hemo + Pos	0	0	0	1	0	0	1
AF Hemoglobin + Fast	0	0	0	1	3	5	9
AF Hgb/Poss other va	0	0	0	1	0	0	1
Hemoglobin AFD or AFG Trait	1	1	1	2	0	0	5
Hemoglobin ASF	1	1	1	2	0	2	7
Hemoglobin E Trait	16	6	7	14	6	12	61
Hemoglobin AE with some F	0	0	0	1	0	0	1
Hemoglobin FAE Trait+BART	0	0	0	0	0	3	3
Hemoglobin ACF	0	0	0	0	1	0	1
Hemoglobin O Ar Trait	1	3	0	0	3	1	8
Grand Total	**2,067**	**1,896**	**1,942**	**1,874**	**1,749**	**1,756**	**11,284**

For questions regarding this report contact the MSDH Newborn Screening Program at 601-576-7619.