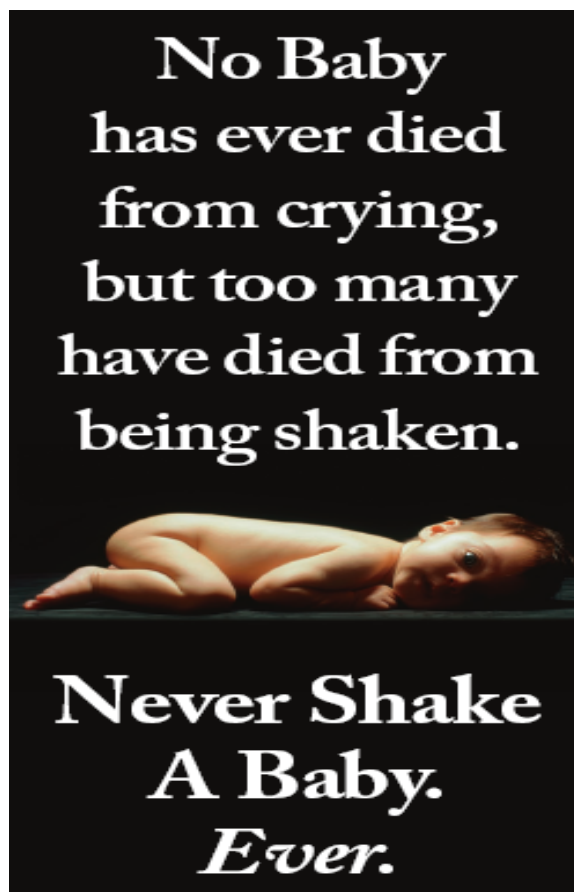


# Never Shake a Baby Arizona Annual Evaluation Report

(July 1, 2013- June 30, 2014)

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\*Data presented above is the most current to date

## Executive Summary

Prevent Child Abuse Arizona initiated the Never Shake a Baby Arizona program (NSBAz) in northern Arizona at the Flagstaff Medical Center and in southeastern Arizona at the University Medical Center in Tucson in the fall of 2003. Never Shake A Baby Arizona, in continuous operation since then has now offered parent education to approximately 235,539 Arizona parents. Parents have consistently responded positively to Never Shake A Baby Arizona education and often voice their commitment to keeping their infants safe; therefore, the primary objective for the program has been to increase the number of hospitals providing the parent education and to expand the program to additional home visiting and other community-based practitioners and programs, and eventually to all parents and the public at large. The future of the Never Shake a Baby Arizona program will also include expanding education efforts to outpatient Pediatric, OB/GYN, and Family Practice offices.

This goal continues to be fulfilled with the addition of hospital nurses; home visitors; Court Appointed Special Advocates (CASAs); Fire Department First Responders; home visiting programs staff; high school child development classes; student nurse associations; local Safe Kids Coalitions; First Things First Regional Family Fun Days in Apache-Navajo, Whiteriver Apache, and Navajo Nation Regions; foster parents; and county public health departments involved in maternal/child health, injury prevention and child care consultation. The Coordinator presented multiple workshops to teen parents; child care workers; Child Fatality Review Committees; high school, community college, university students in nursing, child development, infant mental health; and child welfare and juvenile justice personnel. The ripple effect of these people teaching their clients is not quantified in this Evaluation Report, but anecdotally it is significant. Indeed, the only clients reported as educated about the program are those new parents discharged with a newborn and trained by hospital nurses and home visitors.

In individual contacts with parents (involving 41,588 families at newborn discharge and an additional 6,300 families on home visits in 2012-13, Never Shake A Baby Arizona consists of a 15 minute intervention in which parents of newborns receive education about infant crying as normal behavior, how to soothe crying infants, and how to handle their own frustrations, since

crying and the adult frustration it engenders is the most frequent trigger for Shaken Baby Syndrome. Parents also learn about the dangers of shaking babies and methods to avoid shaking. Hospital personnel (primarily nurses) and family service providers are responsible for administering the program. The primary tasks are to solicit parents' participation in program activities that include watching a video, accepting written materials for reference at home, and reading and signing a Commitment Form where they develop a plan for coping with crying at home and agree to share what they learn about the dangers of shaking with their baby's other caregivers. The educators discuss the dangers of shaking babies and are asked to witness parents signing the Commitment Forms.

The goal of Never Shake A Baby Arizona is to reduce Shaken Baby Syndrome (SBS), also known as Abusive Head Trauma (AHT), and to reduce the costs in quality of life and health care required to treat injuries associated with this type of child maltreatment in Arizona.

Approximately half of Arizona birthing hospitals are implementing the Never Shake A Baby Arizona program, making it difficult to report statewide reductions in the incidence of this form of infant/young child maltreatment. Additionally, the true incidences of SBS/AHT may be significantly underestimated due to misdiagnosis or missed altogether.

In Arizona, the number of fatal and non-fatal incidents of Abusive Head Trauma (AHT) has fluctuated year to year. FY 2013 data from Arizona Department of Health Services, Bureau of Women's and Children's Health indicate that the number of non-fatal hospitalizations due to abusive head injuries among Arizona infants and young children rose from an all-time low of 28 in 2012 to 41 in 2013. According to the Child Fatality Review Report, the number of deaths attributed to confirmed incidents of AHT/SBS was eight, with an additional six cases where shaking was suspected but could not be confirmed as the cause of death.

Initial hospital charges in 2012 for non-fatal hospitalizations due to AHT/SBS totaled \$2,141,604 with AHCCCS/Medicaid as the expected payer for the majority of these hospitalizations (75%). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per

hospitalization was \$83,463. Victims of shaking were overwhelmingly male (75%) and the average length of stay for an infant was 8 days.

In 2013 there were ten emergency department visits for abusive head injuries. According to Child Fatality Review, there were eight confirmed deaths due to shaken infant syndrome and six cases of abusive head trauma where shaking could not be confirmed. The children who had been shaken stayed an average of 10 days in the hospital with charges totaling \$4,052,122 with AHCCCS/Medicaid the expected payer for 81% of the cases. Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$106,173.

In Arizona, NSBAz is not yet universally provided in all birthing hospitals. Hospital data appears to reinforce SBS/AHT as a costly, and largely taxpayer paid, public health issue affecting not only the children and families involved, but also adding to costs in education and rehabilitation systems.

The National Center on Shaken Baby Syndrome reports that on average, approximately 1300 children experience severe to fatal abusive head trauma each year. With published research from four Children's Hospitals around the US identifying an increase in AHT cases since the start of the economic recession<sup>9i</sup>, the need to educate all parents remains vital to share the consequences of abusive head injuries in babies and protective strategies to prevent shaking them.

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<sup>9</sup> **An Increase in Abusive Head Trauma during the Current Recession: A Multi-Center Analysis**

**Rachel P. Berger, Janet Fromkin, Haley Stutz, Kathi Makoroff, Kenneth Feldman, Philip V. Scribano, Tom Songer. Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA; Cincinnati Children's Hospital, Cincinnati, OH; Seattle Children's/Harborview Medical Center, Seattle, WA; Nationwide Children's Hospital, Columbus, OH; University of Pittsburgh School of Public Health, Pittsburgh, PA.**

## Introduction

Prevent Child Abuse Arizona first contracted with LeCroy & Milligan Associates, Inc. in 2003 to conduct an evaluation of the Never Shake a Baby Arizona (NSBAZ) *pilot* program. The program was initially implemented in northern Arizona at the Flagstaff Medical Center (FMC) in Flagstaff and in southern Arizona at the University Medical Center (UMC) in Tucson in the fall of 2003, and has been in continuous operation since. In 2006, Prevent Child Abuse contracted with Beth Sedlet to manage and report data collected via Commitment Forms submitted from hospitals and community programs.

This report is the eleventh in a series of annual evaluation reports. The first report, *Never Shake a Baby Arizona FY2004 Annual Evaluation Report*, presented program implementation findings related to the start-up of the pilot program and included recommendations for program improvement. The second and third annual reports, *Never Shake a Baby Arizona Annual Evaluation Reports FY2005 and FY2006*, included program implementation and intermediate outcome findings regarding the participants' recall of the main messages of the Never Shake A Baby Arizona program six months after completion. The evaluation findings in those reports indicated that the program was well-received by parents: **more than 90% found the program helpful and remembered its main messages about the dangers of shaking babies and methods to handle the stress related to babies crying for prolonged periods of time.**

Subsequent evaluation reports provide data on program expansion looking at the number of families in Arizona that received the Never Shake A Baby Arizona program statewide, by institution or organization, with updated data on abusive head injuries among Arizona infants and young children from the Arizona Department of Health Services. Electronic Annual Reports are viewable at [www.nsbaz.org](http://www.nsbaz.org).

NSBAZ has presented to a variety of home visiting program staff including Healthy Families, Nurse Family Partnership, and Healthy Start. These home visitors provide services to families who are at high risk for abusing their children. They utilize NSBAZ materials to talk with program families about infant crying and the dangers of shaking. Home visitors have shared how the



Never Shake a Baby program has opened the door to impactful conversations with new parents:

“Before being trained about the Never Shake a Baby program, I didn’t know how important it is that I talk frankly to parents about the dangers of shaking.”

Another home visitor in Tucson says:

“Even though I’m a parent myself, I never felt comfortable talking with new parents about shaking. I didn’t want to seem like I thought they would hurt their children. Using the Never Shake a Baby DVD lets me start the conversation in a natural way and help parents identify sources of support if their baby is crying.”

In addition to clear messages about the dangers of shaking young children, the NSBAz Coordinator also infuses presentations with messages about positive social emotional development for all babies and toddlers so that they get off to a good start in life.

## Program Description

The Never Shake A Baby Arizona program consists of a 15 minute intervention that is conducted in hospitals, homes, and community organizations with parents of newborns and young infants. The premise of the program is that the period just after the baby's birth provides an optimal "teachable moment" wherein parents can be educated about their role in protecting, loving, and finding delight in their babies. The dangers of shaking babies as well as methods to avoid shaking them when frustrated are also discussed. Research suggests that during moments of frustration and stress, particularly associated with babies who cry for prolonged periods of time, parents will recall what they learned from the program and implement strategies they wrote on the Commitment Form Plan instead of shaking their child. Techniques are provided such as wearing the baby in a sling or baby holder, calling a friend or relative for help, or giving parents the permission to let the baby cry (while checking on the baby at least every ten minutes).<sup>10</sup>

Peer reviewed research of the original New York program conducted by Dr. Mark Dias (2005) supports the basic program premise: "A coordinated, hospital-based, parent education program, targeting parents of all newborn infants, can reduce significantly the incidence of abusive head injuries among infants and children less than 36 months of age."<sup>11</sup>

The Never Shake A Baby Arizona Coordinator oversees program implementation. The initial Coordinator was Phyllis Palla, RN; the second Coordinator was Patrice Herberholst, RN; the third Coordinator was Mary Warren, PhD, IMH-E®(IV); a new Coordinator, Nicole Valdez, LCSW, IMHE(III) took over Sept 2012. The Coordinator is responsible for grant writing and grants management, contacting hospital/program administration for approval to implement the program, training hospital, home visiting, public health, and parent education staff on the proper implementation and data collection procedures, supplying them with program materials, and

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<sup>10</sup> For more information go to [www.nsbaz.org](http://www.nsbaz.org) and [www.pcaaz.org](http://www.pcaaz.org)

<sup>11</sup> Dias, M.S.; H. Silberstein; V. Li; K. Smith & K. deGuehery. (2004). *The Infant Shaken Impact Syndrome: A parent education campaign in upstate New York*. Women and Children's Hospital of Buffalo, New York

requesting that completed Commitment Forms are submitted to the data manager.

In 2006, printed program materials were revised to include a multi-colored door hanger for parents to use at home that highlights tips for soothing a crying child and reducing parental frustration. The 24 hour ChildHelp crisis line telephone number is provided in two places in the door hanger. With funding from the Virginia G. Piper Charitable Trust and the Child Abuse Prevention License Plate Fund, materials were reprinted in 2009. The Program Coordinator is currently exploring the possibility of increasing the use of technology to further spread the education via QR codes, partnering with Text4Baby, and use of social media platforms.

As part of the program, the Commitment Form was revised to eliminate the detailed demographic data collection needed for evaluation of the pilot. Instead, in addition to signing the form to indicate that they have received information about the dangers of shaking infants, parents are asked to write down their Plan to use when their baby cries inconsolably. This step encourages them to incorporate lessons learned from the video and nurse explanation, and to pass it on to everyone who cares for their child. The Coordinator has worked with hospital Risk Management personnel to customize the Commitment Form to allow submission of signed forms to NSBAz for evaluation tracking.

In 2010, the Never Shake A Baby Arizona Public Service Announcement workgroup, a collaboration of Never Shake A Baby Arizona Task Force members from Phoenix Children's Hospital and the Phoenix Police Department, with help from Chili Pepper Productions, developed a script and participated in filming an updated and shortened training video as well as a thirty second PSA. New videos have been sent to all implementing hospitals and programs, as well as distributed to cable TV and radio broadcasting sources. The training video is now a crisp five minutes, showing safe sleep practices in addition to infant soothing techniques, with a message from the Phoenix Police Department to add emphasis to the consequences of adult frustration. The video and PSA, in English, Spanish, and closed captioned for the hearing impaired, can be downloaded from [www.nsbaz.org](http://www.nsbaz.org). The link has been provided to other websites, ie., Phoenix

Children's Hospital, Arizona Department of Health Services, as well as other states.

The Coordinator continually revises training presentations to incorporate new research findings and to stress consistent, nurturing responses to baby's cries, infant crying as normal child behavior, and parental feelings of delight in their new child. Customized training presentations are available for Emergency Department staff focusing on signs, symptoms, and treatment of AHT. Information is also provided to target audiences about professional resources available at Zero To Three ([www.zerotothree.org](http://www.zerotothree.org)), the Infant Toddler Mental Health Coalition of Arizona ([www.itmhca.org](http://www.itmhca.org)), as well as advice for parents and caregivers from the Fussy Baby Network staff of the Birth To Five Helpline at Southwest Human Development ([www.swhd.org](http://www.swhd.org)).

In hospitals, clinical coordinators, clinical educators, and charge and floor nurses are responsible for administering the program. As part of the newborn discharge process, nurses talk to parents of newborns to request their participation in program activities that include watching a video, accepting written materials to take home, and reading and signing a Commitment Form with their Plan, agreeing to share what they learn with other caregivers. The nurses also discuss the dangers of shaking babies and are asked to witness parents signing the Commitment Forms. In home visits and community service organizations, families of newborns and older infants are offered within the program, and similar procedures are followed.

The program materials highlight the consequences of shaking babies and methods to avoid shaking. The video options available to participants include *Coping with Infant Crying: Preventing Shaken Baby Syndrome* (the updated video produced under a grant from the International Association of Business Communicators by Chili Pepper Productions), *Babies Cry* (produced by the Shaken Baby Alliance in Texas), *When Your Baby Cries*, which is targeted to Native Americans (produced by the University of Oklahoma Health Sciences Center), and *Portrait of a Promise* (produced by the Children's Medical Center in St. Paul, MN) used in the Banner Hospitals. Spanish-speaking versions of all videos are also available. For parents who speak neither English nor Spanish, UMC provides electronic translation equipment for watching the video. The updated *Coping with Infant Crying* video is also

closed captioned for the hearing impaired. Since 2006, multiple copies of the *Coping with Infant Crying* video are provided free of charge.

In non-hospital settings, similar training materials are used, somewhat modified for the audience. For instance, the procedure for collecting and submitting Commitment Forms is deleted from trainings for non-institutionalized settings and workshops.

## **Abusive Head Injuries among Arizona Infants and Young Children, 2006-2013**

The information in this section was provided by ADHS Bureau of Women's and Children's Health (BWCH)<sup>12</sup>. The BWCH compiles annual data based on the abusive head injury fatalities identified in the Arizona Child Fatality Review Program annual reports and on the non-fatal hospitalizations and emergency department visits due to abusive head injuries (shaken infant or shaken impact syndrome). The cases are identified using methods from a study conducted by Dias et al. (2005).<sup>13</sup> Between years 2004-2007, data for infants and children under the age of two with a code for shaken infant syndrome (995.55) in any of the diagnostic fields were included.

Additionally, cases with a diagnostic code for skull fracture or intracranial injury (800-804.9), retinal hemorrhage (362.81), or intracranial hemorrhage (853.0, 853.1) with an external cause of injury code for known or suspected homicide/assault (E960-E968 and E980-E989) were included.

Beginning in 2008, the hospital discharge database was updated to allow for the collection of up to 25 ICD-9 codes and 6 External causes of injury codes. This is an increase from the previous data layout, which only allowed for up to 9 ICD-9 codes and 1 External cause of injury code. The external cause codes (up to 6) apply to ALL diagnosis codes. Therefore, a patient could have a principal diagnosis that is not an injury, but have a secondary diagnosis that is an injury, and the E code for that secondary diagnosis would be reported.

Additionally, beginning in 2008, hospital coders were required to report external causes of injury on all patients, including those transferred from another facility. Previously external cause of injury data were only collected on a patient's initial visit for an injury, not any subsequent transfers to other hospitals.

For 2007 and prior discharges, the one external cause of injury code reported was for the principal diagnosis only. If there was a secondary diagnosis on which an E code was appropriate, the state did not collect it. Because of all these changes, comparison is not recommended between data prior to 2008 and data from 2008 and later.

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<sup>12</sup> Schacter, A., Abusive Head Injuries Among Infants and Young Children 2004-2009, Arizona Department of Health Services, Bureau of Women's and Children's Health, November 2010.

<sup>13</sup> Dias MS, Smith K, deGuehery K, *et al.* Preventing Abusive Head Trauma among Infants and Young Children: A Hospital-Based, Parent Education Program. *Pediatrics*. 2005;115:e470-e477.

In the study by Dias and colleagues (2005), all suspected cases of abusive head injury were reviewed in detail by a multidisciplinary medical team to confirm the nature of the inflicted injuries. For this report on abusive head injury in Arizona during 2006-2013, the number of non-fatal hospitalizations represents *an estimate* because ADHS was unable to conduct an extensive review of medical records for non-fatal cases.

## 2006

There were 22 non-fatal hospitalizations in 2006. Sixty-four percent were males (n=14) and 36 percent were females (n=8). The children stayed a total of 244 days in the hospital, and the mean length of stay was 11 days. The hospital charges totaled \$1,630,998, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (68 percent, n=15). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$108,733. There were five emergency department visits for abusive head injuries. According to the Child Fatality Review program, there were **nine confirmed deaths** due to shaken infant syndrome in 2006: seven deaths occurred in Maricopa County; one death in Apache County, and one death in Gila County. There were no deaths reported in Pima and Coconino Counties, where the program has been in effect since 2003.

## 2007

There were 22 non-fatal hospitalizations in 2007. Fifty-five percent were males (n=12) and 45 percent were females (n=10). The children stayed a total of 248 days in the hospital, and the mean length of stay was 11 days. The hospital charges totaled \$1,566,940, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (68 percent, n=15). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$80,312. There were six emergency department visits for abusive head injuries. According to the 15<sup>th</sup> Annual Child Fatality Review program, there were **eleven confirmed deaths** due to shaken infant syndrome in 2007.

## 2008

There were 42 non-fatal hospitalizations in 2008. Sixty-two percent were males (n=26) and 38 percent were females (n=16). The children stayed a total of 492 days in the hospital, and the mean length of stay was 12 days. The hospital charges totaled \$3,664,454, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (71 percent, n=30). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$70,210. There were four emergency department visits for abusive head injuries. According to the Child Fatality Review Program, there were **five confirmed deaths due to shaken infant syndrome in 2008, and two confirmed cases of abusive head trauma** that may not have involving shaking. The 16<sup>th</sup> Annual Child Fatality Review Report, published in November 2009, explains these deaths.<sup>14</sup> The non-fatal hospitalizations due to abusive head injuries were reported from eight facilities during 2004-2008.

### **2009**

There were 62 non-fatal hospitalizations in 2009. Sixty-one percent were males (n=38) and 39 percent were females (n=48). The children stayed a total of 476 days in the hospital, and the mean length of stay was 8 days. The hospital charges totaled \$4,241,327, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (77 percent, n=48). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$44,932. There were eight emergency department visits for abusive head injuries. According to the Child Fatality Review Program, there were **seven confirmed deaths due to shaken infant syndrome in 2008, and four confirmed cases of abusive head trauma** that may not have involving shaking. The 17<sup>th</sup> Annual Child Fatality Review Report, published in November 2010, explains these deaths.<sup>15</sup> The non-fatal hospitalizations due to abusive head injuries were reported from nine facilities during 2005-2009.

### **2010**

There were 29 non-fatal hospitalizations in 2010. Forty-five percent were males (n=13) and 55 percent were females (n=16). (This gender ratio represents a switch.) The children stayed a total of 220 days in the hospital, and the mean length of stay was 8 days (median= 4 days). The hospital charges totaled \$2,256,718, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (86 percent, n=25). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization

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<sup>14</sup> <http://www.azdhs.gov/phs/owch/pdf/cfr2008.pdf>

<sup>15</sup> <http://www.azdhs.gov/phs/owch/pdf/cfr2009.pdf>



was \$77,929 (median=\$27,389). There were nine emergency department visits for abusive head injuries. According to the Child Fatality Review Program, there were four confirmed deaths due to shaken infant syndrome in 2010, and four confirmed cases of abusive head trauma not involving shaking.

### **2011**

There were 44 non-fatal hospitalizations in 2011. Forty-five percent were males (n=20) and 55% were females (n=24). The children stayed a total of 294 days in the hospital, and the mean length of stay was 7 days (median = 4 days). The hospital charges totaled \$3,054,575, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (75%, n=33). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$74,741 (median = \$39,571). There were two emergency department visits for abusive head injuries. According to the Child Fatality Review Program, there were twelve confirmed deaths due to shaken infant syndrome in 2011, and five cases of abuse head trauma where shaking could not be confirmed.<sup>16</sup>

### **2012**

There were 28 non-fatal hospitalizations in 2012. Seventy-five percent were males (n=21) and 25 percent were females (n=7). The children stayed a total of 214 days in the hospital, and the mean length of stay was 8 days (median= 3 days). The hospital charges totaled \$2,141,604 and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (75 percent, n=21). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$83,463 (median=\$49,975). According to Child Fatality Review, there were six confirmed deaths due to shaken infant syndrome in 2012, and three cases of abusive head trauma where shaking could not be confirmed.<sup>17</sup>

### **2013**

There were 41 non-fatal hospitalizations in 2013. Sixty-one percent were males (n=25) and 39 percent were females (n=16). The children stayed a total of 409 days in the hospital, and the mean length of stay was 10 days (median= 4 days). The hospital charges totaled \$4,052,122 and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (81 percent, n=33). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$106,173 (median=\$52,220). There were ten emergency department visits for abusive head injuries. According to Child Fatality Review, there were eight confirmed deaths due to shaken

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<sup>16</sup> <http://www.azdhs.gov/phs/owch/pdf/cfr/19th-annual-child-fatality-review-report-nov-2012.pdf>

<sup>17</sup> <http://www.azdhs.gov/phs/owch/pdf/cfr/20th-annual-child-fatality-review-report-nov-2013.pdf>

infant syndrome in 2013, and six cases of abusive head trauma where shaking could not be confirmed.

The non-fatal hospitalizations due to abusive head injuries were reported from ten facilities during 2006-2013. Table 1 shows non-fatal hospitalizations due to abusive head injury by facility.

**Table 1. Non-Fatal Hospitalizations due to Abusive Head Injury by Facility, Arizona 2009-2013**

Facility	2009 (n=62)		2010 (n=29)		2011 (n=44)		2012* (n=28)		2013* (n=41)	
	n	N	N	%	n	%	n	%	n	%
Banner Desert Medical Center	9	15%	3	10%	2	5%	*	*	8	20%
Maricopa Medical Center	2	3%	3	10%	1	2%	*	*	*	*
Phoenix Children's Hospital	25	40%	16	55%	30	68%	18	64%	24	56%
St. Joseph's Hospital and Medical Center	8	13%	3	10%	3	7%	*	*	-	-
Tucson Medical Center	5	8%	-	-	-	-	-	-	-	-
University Medical Center	9	15%	4	14%	7	16%	*	*	6	15%
Flagstaff Medical Center	2	3%	-	-	1	2%	*	*	*	*
Banner Good Samaritan Medical Center	-	-	-	-	-	-	-	-	-	-
Los Niños Hospital	1	2%	-	-	-	-	-	-	-	-
Scottsdale Shea Hospital	1	2%	-	-	-	-	-	2%	-	-

\* Indicates cases of SBS/ AHT but fewer than 6 have been suppressed by ADHS

During 2006-2013, the majority of children hospitalized for abusive head injuries resided in Maricopa County. Table 2 shows non-fatal hospitalizations due to abusive head injuries by county of residence.

**Table 2. Non-Fatal Hospitalizations for SBS/AHT by County of Residence 2008-2013**

County of Residence	2008 (n=42)		2009 (n=62)		2010 (n=29)		2011 (n=44)		2012 (n=28)		2013 (n=41)	
	n	%	n	%	n	%	n	%	n	%	n	%
Apache	-	-	-	-	-	-	-	-	-	-	-	-
Cochise	-	-	-	-	1	3%	-	-	*	*	-	-
Coconino	3	7%	2	3%	-	-	1	2%	*	*	*	*
Gila	1	2%	-	-	-	-	-	-	-	-	*	*
Graham	-	-	1	2%	-	-	1	2%	*	*	-	-
Greenlee	-	-	-	-	-	-	-	-	-	-	-	-
La Paz	-	-	-	-	-	-	2	5%	-	-	-	-
Maricopa	28	67%	30	48%	20	69%	22	50%	10	36%	24	56%
Mohave	-	-	2	3%	-	-	1	2%	-	-	*	*
Navajo	1	2%	1	2%	2	7%	1	2%	*	*	*	*
Pima	5	12%	12	19%	2	7%	9	20%	*	*	6	15%
Pinal	2	5%	6	10%	2	7%	3	7%	6	21%	*	*
Santa Cruz	-	-	2	3%	1	3%	-	-	-	-	-	-
Yavapai	1	2%	4	6%	1	3%	1	2%	*	*	*	*
Yuma	-	-	2	3%	-	-	2	5%	-	-	*	*

\*Indicates cases of SBS/ AHT but fewer than 6 have been suppressed by ADHS

The sharp increase in abusive head trauma between 2008 and 2009 may have been the result of administrative changes in reporting hospital discharge data. Cases that may not have been previously reported as intentionally inflicted injuries are now reported by each hospital at which a child is seen. This change increases the likelihood that a case of abusive head trauma will be reported and captured in the hospital discharge data; it also increased the likelihood that the same child may be reported by more than one hospital if they are seen at different facilities. Figure 1 compares the number of abusive head trauma-related fatalities to inpatient hospitalizations and emergency department visits by year for 2006-2013.

The total charges for inpatient stays due to AHT/SBS in 2012 were \$2,141,604, reflecting 28 non-fatal admissions. The percentage of cases covered under AHCCCS has remained over 75%, up from 69% in 2004. According to the

ADHS data, the average hospitalization cost per case, for which the expected payer was AHCCCS/Medicaid, was \$83,463 per case in 2004 (69% of cases); \$58,716 per case in 2005 (76% of cases); \$108,733 per case in 2012 (75% of cases) and \$106,173 per case in 2013 (81% of cases). Again, due to changes in the way the data are collected, year to year comparisons cannot be accurately made. However, it is clear that the public pays a significant share of costs for these preventable admissions.

The incidence and cost of hospitalization due to abusive head injuries among young children justifies the need for educating all parents of newborns and young infants about Abusive Head Trauma/Shaken Baby Syndrome.

## **Program Goals and Objectives**

As demonstrated above, shaking babies can lead to serious injury or death. The emotional and financial toll on families can also be staggering. The continual care required often necessitates that one parent become a full-time caregiver. This can lead to loss of income and tensions in the family, especially among other siblings who may sometimes feel neglected. Tragically, a shaking can also cause the break-up of family relationships.

Although Shaken Baby Syndrome is relatively rare compared to more common childhood diseases and conditions such as asthma, diabetes or dental caries, the costs are high, and consequences can be, and often are, severe for children and families. The goal of implementing Never Shake A Baby Arizona, therefore, is to eliminate or reduce Shaken Baby Syndrome/Abusive Head Trauma and reduce costs of associated health care and impaired quality of life in Arizona. To that end, a primary objective is to expand the program to all birthing hospitals in Arizona as well as to appropriate home visiting programs, community-based organizations, and Pediatric, Family Practice, and OB/GYN physician offices in order to educate and reinforce to *all* parents of newborns and young children that crying is normal infant behavior, it is dangerous to shake their babies, there are tips to avoid shaking, and the importance of informing their babies' caregivers about infant crying and the dangers of shaking babies.

A logic model that summarizes the program's major resources, activities, objectives, and goals is presented in Exhibit 1 on the following page.

**Exhibit 1. Program Logic Model for Never Shake a Baby Arizona**

Resources	Activities	Objectives	Outcomes
Never Shake A Baby Arizona Coordinator	Program implementation oversight	Train nurses, home visitors and community organization service providers on program implementation and data collection procedures	Decrease the incidence of non-fatal and fatal cases of Shaken Baby Syndrome in Arizona  Decrease associated health care costs in Arizona  Increase quality of life for all children and families
	Program development	Expand program to all Arizona hospitals; expand program to community-based organizations  Develop web-based communication	
Hospital nursing staff  Community-based organization program providers	Discuss crying and the dangers of shaking babies with parents  Provide parents written materials on methods to avoid shaking  Show parents video on consequences of shaking/methods to avoid	Educate all parents of newborns and young infants on crying as normal infant development and the dangers of shaking babies and methods to avoid shaking	
	Have parents sign commitment forms  Submit signed forms to evaluation team	Parents develop plan to cope with crying and commit to sharing information with all their babies' caregivers  Signed commitment form	
NSBAz Data Manager	Count and verify commitment forms	Report numbers of parents receiving program  Monitor program implementation and data collection; work with sites to correct issues	
Funding	Administrative and supply costs	Program sustainability	

### *Expansion of the Program*

In 2011-2012, Never Shake A Baby Arizona experienced steady growth in the number of hospitals and organizations offering services to the parents of newborns and young infants. The table below presents the complete list of organizations currently providing services, and in what year and month the program was initiated. New nursing staff at Paradise Valley and West Valley Hospitals, Banner Thunderbird, and new groups of home visitors, student nurses, child care workers, child development students (high school and university), and court affiliated personnel (judges, CASAs, child welfare personnel, and early intervention providers) were trained in 2013-14.

All hospitals and organizations offering parent education in 2013-2014 can be seen in the following exhibit. (Some hospitals or organizations have been trained and are not yet implementing the program, have been trained and are not submitting Commitment Forms, or have ceased providing the program.)

<b>Exhibit 2. Hospitals and Organizations offering NSBAZ Education*</b>				
<i>Organization Name</i>	<i>Organization Type</i>	<i>Date of Program Training</i>	<i>Date of Program Initiation</i>	<i>Ceased Providing Program</i>
Arrowhead Medical Center	Hospital	July 2008		
Banner Desert Medical Center (BDMC) and Cardon Children's	Hospital	December 2007	January 2008	
Banner Baywood Medical Center	Hospital	June 2009	Jan 2010	
Banner Del Webb (BDW)	Hospital	March - April 2009 May 2012	May-09	
Banner Estrella Medical Center (BEMC)	Hospital	May 2008	July 2008	
Banner Gateway Medical Center (BGMC)	Hospital	January 2009	January-09	

<b>Exhibit 2. Hospitals and Organizations offering NSBAZ Education*</b>				
<i>Organization Name</i>	<i>Organization Type</i>	<i>Date of Program Training</i>	<i>Date of Program Initiation</i>	<i>Ceased Providing Program</i>
Banner Good Samaritan Medical Center (BGS MC)	Hospital	February 2008	August-08	
Banner Ironwood	Hospital	Oct 2010	Nov 2010	
Banner Thunderbird Medical Center	Hospital	June 2014	June 2014	
Casa Grande Regional Medical Center	Hospital	October 2008, September 2009		
Cobre Valley Community Hospital (CVCH)	Hospital	March 2008	June 2008	
Flagstaff Medical Center (FMC)	Hospital	July 2003	August 2003	
John C. Lincoln Hospital North Mountain (JCLH)	Hospital	March-April 2008	August 2008	March 2011
Holy Cross Hospital	Hospital	October 2009		
Kingman Regional Medical Center (KRMC)	Hospital	September 2006	November 2006	
Maryvale Hospital	Hospital	February 2007	April 2007	
Maricopa Medical Center (MIHS)	Hospital	Dec 2010	May 2011	
Maricopa Medical Center (MIHS)	Outpatient	Dec 2010	May 2011	
Mount Graham Regional Medical Center (MGRMC)	Hospital	January 2009	February 2009	
Mountain Vista Medical Ctr	Hospital	February 2010	March 2010	X
Phoenix Baptist Hospital (PBH)	Hospital	January 2007	March 2007	X



<b>Exhibit 2. Hospitals and Organizations offering NSBAZ Education*</b>				
<i>Organization Name</i>	<i>Organization Type</i>	<i>Date of Program Training</i>	<i>Date of Program Initiation</i>	<i>Ceased Providing Program</i>
Phoenix Children's Hospital (PCH)	Hospital	January 2007	February 2007	
Scottsdale Healthcare Osborn (SHCO)	Hospital	August - September 2007	August 2008	
Scottsdale Healthcare Shea (SHCS)	Hospital	August - September 2007	August 2008	
St. Joseph's Hospital and Medical Center	NyICU	February 2009	November 2009	
St. Joseph's Hospital and Medical Center	Hospital	April 2008	February 2010	
Summit Healthcare, Show Low	Hospital	June 2009	August 2010	
Tucson Medical Center (TMC)	Hospital	May 2007	May 2007	X
University Medical Center (UMC)	Hospital	September 2003	October 2003	
Verde Valley Medical Center	Hospital	Sept 2010	February 2012	
Western Arizona Regional Medical Center (WARMC)	Hospital	November 2006	February 2007	
Whiteriver Indian Health Service	Hospital	October 2010	Nov 2010	
Yavapai Regional Medical Center	Hospital	August - September 2008 Sept 2010		
<b>Home Visiting Programs</b>				
Beautiful Beginnings, Apache/Navajo	Home Visiting	October 2009	March 2010	x

<b>Exhibit 2. Hospitals and Organizations offering NSBAZ Education*</b>				
<i>Organization Name</i>	<i>Organization Type</i>	<i>Date of Program Training</i>	<i>Date of Program Initiation</i>	<i>Ceased Providing Program</i>
Health Start (ADHS), Statewide	Family and children services provider	February 2008	April 2008	
Healthy Families, Statewide	Home Visiting	October 2007	Jan 2008	
So Phoenix Healthy Start	Home Visiting	February 2010	March 2010	
Newborn Intensive Care Program, state	Home Visiting	March 2008	May 2009	
Nurse Family Partnership, Pima County	Home Visiting	May 2010	July 2010	
Nurse Family Partnership, Maricopa County	Home Visiting	Nov 2010		
Southwest Human Development (SWHD)	Family and children services provider	March 2007	May 2007	
Yavapai County Home Visiting Coalition	Home Visiting	August 2010		
Platicamos Salude, Mariposa CHC	Home Visiting	April 2011		
Healthy Mothers/ Healthy Babies	Home Visiting	March 2012		

\*corroborated by submitted Commitment Forms. Other programs may offer NSBAz education; however, they do not routinely submit Commitment Forms.

### ***Expansion of the Education***

In addition to hospital and home visiting programs, educational presentations in 2012-2013 have also included a workshop for the ASU graduate students in Infant Family Practice, Healthy Families home visitors,

at risk teens in the TOPS program of Tucson, Foster Care Licensing workers, and Court Appointed Special Advocates with cases involving infants and toddlers in foster care.

A redesigned website at [www.nsbaz.org](http://www.nsbaz.org) now encourages searches on research articles about shaken baby syndrome, parenting tips to calm crying, videos, training presentations, as well as Arizona specific data on program implementation and evaluation.

The Infant Death Investigation Checklist and AZPOST training video have been transitioned to the Arizona Department of Health Services, Child Fatality Review, to maintain and track their use.

### *Expansion of funding*

From program inception, the Child Abuse Prevention License Plate Fund has generously funded Never Shake A Baby Arizona. In 2006, BHHS Legacy added critical funding, in particular to convene the SUIDI Group. Also in 2006, the Arizona Department of Health Services, Bureau of Women's and Children's Health allocated a small portion of the federal Maternal Child Health Grant to enable printing of the new parent education door hangers. In 2009, the Virginia G. Piper Charitable Trust added funds for both program operation and a new printing of the parent education door hangers. In 2010, the Margaret T. Morris Foundation added to operations funds and enabled the replication of the new training videos and PSAs. In 2011, the Phoenix Suns Charities added to operating funds, particularly to increase educational presentations to student nurses and child care workers.

### *Data Collection and Families Served*

Parents are asked to sign a Commitment Form saying they will ensure that they and any caregivers of their babies will use methods learned through the program to cope with crying babies. On the Commitment Form, parents also note actions they could take for themselves to cope with their baby's crying, and list a person or persons they could call for help and support when upset by their babies' prolonged crying. By signing the forms, parents "commit" to sharing the information they learned with their babies' other caregivers. The English version of the Commitment Form is presented in Appendix A (it is also available in Spanish). Each hospital customizes the Commitment Form

with their logo. A program sustainability feature is that hospitals reproduce these forms.

The signed forms are mailed to Beth Sedlet, Never Shake A Baby Arizona Data Manager, on a monthly basis along with a data cover sheet stating the number of births for the reporting month in the case of birthing hospitals, or the number of parents eligible to receive the program in the case of community-based organizations. The numbers are then checked and entered into a database. Parent names are not recorded; Commitment Forms are shredded after each monthly report is completed. (To respond to concerns of hospital legal and risk management departments, some hospitals have modified the Commitment Form to provide additional information giving parents “informed consent” when signing the form.) As part of the sustainability features for NSBAz, hospitals and community organizations fund clerical and mailing costs for data collection.

Data reports detailing the percentage of births educated about NSBAz by hospital/community-based program are emailed out to nurse contacts on a monthly basis. Reports are also posted on [www.nsbaz.org](http://www.nsbaz.org). Nurse managers use the monthly reports as a means to continually motivate staff to ensure their hospital/program successfully competes with others to educate close to 90% of all new parents.

In 2013-14, 41,588 parents were educated prior to being discharged with a newborn. An additional 6,300 families were provided the Never Shake A Baby Arizona messages and materials on home visits through Healthy Families, Nurse Family Partnership-Maricopa, Nurse Family Partnership-Pima, Healthy Start, Health Start, Southwest Human Development NICP. Even more families were educated by other home visiting program staff who have received Never Shake training and operate under program protocols requiring discussion about coping with crying and shaken baby prevention, although their education numbers cannot be verified by signed Commitment Forms. The chart in Appendix B shows how many parents were offered Never Shake A Baby Arizona education by each hospital and home visiting program – not all home visiting programs report using Commitment Forms.

Statewide, the total number of families that have received Never Shake A Baby Arizona education since program inception is over now 235,539, with over 6200 families receiving services in 2006-07, over 15,500 being educated in 2007-2008, 25,200 educated in 2008-2009, 32,800 in 2009-2010, 39,581 in 2010-2011, 35,741 educated in 2011-12, 38,452 educated in 2012-13, and 41,588 educated in 2013-14. The cumulative efforts to educate Arizona parents is shown in the table below, detailing births and parents educated at newborn discharge by year from program inception through the 2012-2013 reporting period.

<b>Table 3.</b>		<b>Cumulative Program Data</b>			
<b>Year</b>	<b>Total number of births</b>	<b>Number Families who Accepted Program</b>	<b>Number of Families Offered Program</b>	<b>Percentage of Births Offered Education</b>	<b>Percentage of Births Educated</b>
FY 2005 May 2004-April 2005 (includes all data from inception of program in August 2003)	6355	4098	4431	70%	64.48%
FY 2006 May 2005-April 2006	3956	2720	3007	76%	68.76%
FY 2007 July 2006-June 2007	6269	3850	4002	64%	61.41%
FY 2008 July 2007-June 2008	18614	15675	15815	85%	84.21%
FY 2009 July 2008-June 2009	32511	25201	25461	78%	77.52%
FY 2010 July 2009-June 2010	38388	33290	33494	87%	86.72%
FY 2011 July 2010-June 2011	39581	34951	35102	89%	88.30%
FY 2012 July 2011-June 2012	40460	35741	35801	88%	88%
FY 2013 July 2012-June 2013	43409	38452	38519	89%	89%
FY 2014 July 2013-June 2014	47182	41588	41710	88%	88%
<b>Totals to date</b>	<b>276725</b>	<b>235539</b>	<b>237342</b>	<b>86%</b>	<b>85%</b>

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**Appendix A: Commitment Form Example**  
**Never Shake A Baby Arizona - Commitment Form**

You are your child's best advocate. We need you to prevent the shaking of your baby.

Commitment Statement:

I have learned that crying is normal for babies, and shaking a baby can cause brain damage or death. I will make sure that anyone who watches my child knows about the dangers of shaking.

Please sign for yourself below:

---

Mother's Signature date

---

Father's Signature date

---

Witness' Signature date

My Plan in case my baby cries a lot:

- take my baby for a walk or a ride in the car
- put my baby in a safe place and let him/her cry
- do what I like to relax myself \_\_\_\_\_
- other \_\_\_\_\_

Who I can call for help:

Name of doctor

Telephone number

Name of family member

Telephone number

Name of friend

Telephone number

Note: this statement is not part of the medical record. If found, please return to NSBAZ, c/o Prevent Child Abuse Arizona, P.O. Box 26495, Prescott Valley, AZ 86312



## Appendix B: Parents Educated by Hospital/Organization

<b>Families Receiving Never Shake a Baby Education in Arizona FY 2013-2014</b>					
<b>Hospital</b>	<b>Number of Births</b>	<b>Number of Signed Forms</b>	<b>Number of Refusals</b>	<b>Percentage Births Educated</b>	<b>Percentage Parents Offered Education</b>
<b>BBMC</b>	685	640		93.43%	93.43%
<b>BDMC</b>	4879	4831	28	99.02%	99.59%
<b>BDWMC</b>	1706	1670	4	97.89%	98.12%
<b>BEMC</b>	4205	4057	1	96.48%	96.50%
<b>BGMC</b>	4163	3757	2	90.25%	90.30%
<b>BGSMC</b>	5801	5109		88.07%	88.07%
<b>BIMC</b>	1014	769		75.84%	75.84%
<b>CSTJOE(Tucson)</b>	1741	1192	5	68.47%	68.75%
<b>CVRMC</b>	318	293		92.14%	92.14%
<b>FMC</b>	1225	1190		97.14%	97.14%
<b>HHC</b>	9	7		77.78%	77.78%
<b>KRMC</b>	583	399	3	68.44%	68.95%
<b>MIHS</b>	2738	2323	1	68.44%	68.95%
<b>Maryvale</b>	398	398		100.00%	100.00%
<b>MGRMC</b>	661	614		92.89%	92.89%
<b>PVH</b>	896	779	33	86.94%	90.63%
<b>PCH</b>	218	172		78.90%	78.90%
<b>SHCO</b>	1301	1213		93.24%	93.24%
<b>SHCS</b>	4520	4089	17	90.46%	90.84%
<b>STJOE</b>	3610	2647		73.32%	73.32%
<b>STJOE(NICU)</b>	556	407	4	73.20%	73.92%
<b>SHRMC</b>	901	869		96.45%	96.45%
<b>UAMC-UC</b>	1854	1480	12	79.83%	80.47%
<b>VVMC</b>	516	505		97.87%	97.87%
<b>WVH</b>	1204	925	10	76.83%	77.66%
<b>WARMC</b>	130	120	1	92.31%	93.08%
<b>WIH</b>	42	32		76.19%	76.19%
<b>YRMC</b>	1063	856	1	80.53%	80.62%
<b>SWHD</b>	215	215		100.00%	100.00%
<b>HF-Pima</b>	30	30		100.00%	100.00%
<b>Totals</b>	47182	41588	122	88.14%	88.40%

## Appendix C Site Abbreviations

<b>BBMC</b>	<b>Banner Baywood Medical Center</b>
<b>BDMC</b>	<b>Banner Desert Medical Center</b>
<b>BEMC</b>	<b>Banner Estrella Medical Center</b>
<b>BGMC</b>	<b>Banner Gateway Medical Center</b>
<b>BGSMC</b>	<b>Banner Good Samaritan Medical Center</b>
<b>BDWMC</b>	<b>Banner Del Webb Medical Center</b>
<b>BIMC</b>	<b>Banner Ironwood Medical Center</b>
<b>CSTJOE(TUC)</b>	<b>Carondelet St. Joseph's Hospital (Tucson)</b>
<b>CVRMC</b>	<b>Cobre Valley Regional Medical Center</b>
<b>CCFR</b>	<b>Cochise Child and Family Resources Home Visiting</b>
<b>FMC</b>	<b>Flagstaff Medical Center</b>
<b>HF-Pima</b>	<b>Healthy Families (Pima County) at Child and Family Resources</b>
<b>HF-Pinal</b>	<b>Healthy Families (Pinal County) at Child and Family Resources</b>
<b>HHC</b>	<b>Hopi Healthcare Center</b>
<b>KRMC</b>	<b>Kingman Regional Medical Center</b>
<b>MIHS</b>	<b>Maricopa Integrated Health System</b>
<b>Maryvale</b>	<b>Maryvale Hospital</b>
<b>MGRMC</b>	<b>Mt Graham Regional Medical Center</b>
<b>PVH</b>	<b>Paradise Valley Hospital</b>
<b>PCH</b>	<b>Phoenix Children's Hospital</b>
<b>SHCO</b>	<b>Scottsdale Healthcare Osborn</b>
<b>SHCS</b>	<b>Scottsdale Healthcare Shea</b>
<b>STJOE(NICU)</b>	<b>St. Joseph's Hospital (NICU)</b>
<b>STJOE(PHX)</b>	<b>St. Joseph's Hospital (Phoenix-Couplet Care)</b>
<b>SHRMC</b>	<b>Summit Healthcare Regional Medical Center</b>
<b>SWHD</b>	<b>Southwest Human Development</b>
<b>UAMC-UC</b>	<b>University of Arizona Medical Center- University Campus</b>
<b>VVMC</b>	<b>Verde Valley Medical Center</b>
<b>WVH</b>	<b>West Valley Hospital</b>
<b>WARMC</b>	<b>Western Arizona Regional Medical Center</b>
<b>WIH</b>	<b>Whiteriver Indian Hospital</b>
<b>YRMC</b>	<b>Yavapai Regional Medical Center</b>

## Appendix D: Families Educated by County for FY 2013-14

County	NSBAz Education Rates at Engaged Hospitals for 2013-14				
	Births by County of Residence	# of Births in Implementing Facilities	# of Signed Commitment Forms	Percent of Parents Educated	Parents Educated by County
Apache	927	42	32	76%	3%
Cochise	1673	0	0	0%	0%
Coconino	1,642	1225	1190	97%	72%
Gila	615	318	293	92%	48%
Graham	635	661	614	93%	97%
Greenlee	135	0	0	0%	0%
Maricopa	54,381	37,095	33,232	90%	61%
Mohave	1,755	713	519	73%	30%
Navajo	1,521	910	876	96%	58%
Pima	11,969	3625	2702	75%	23%
Pinal	4,523	1,014	769	76%	17%
Santa Cruz	614	0	0	0%	0%
Yavapai	1,865	1579	1361	86%	73%
Yuma	3,147	0	0	0%	0%
La Paz	212	0	0	0%	0%
<b>Total</b>	<b>85,614</b>	<b>47,182</b>	<b>41,588</b>	<b>88%</b>	<b>49%</b>