

Demographic Distribution of Measles, Mumps, and Rubella (MMR) Vaccine Given in Mass Clinics during an Outbreak in Arizona in 2008

Caleb Wiedeman, Edmee V. Botwright,
Cherry Boardman, Susan Goodykoontz,
Michelle McDonald, Lisa Rasmussen,
Rebecca Sunenshine, Shoana Anderson

Leadership for a Healthy Arizona



Presentation Objectives

- Describe demographic characteristics of people vaccinated by the local health department during the measles outbreak in 2008
- Compare the demographic distribution of those vaccinated during the outbreak to those vaccinated the previous year

Measles Background

- Respiratory and airborne transmission
- Communicability: ± 4 days rash onset
- Incubation Period: 7–21 days
- Clinical features
 - Prodrome (2–4 days)
 - Fever
 - Cough, coryza, conjunctivitis
 - Koplik spots
- Maculopapular Rash
 - Begins on face and head
 - Persists 5–6 days

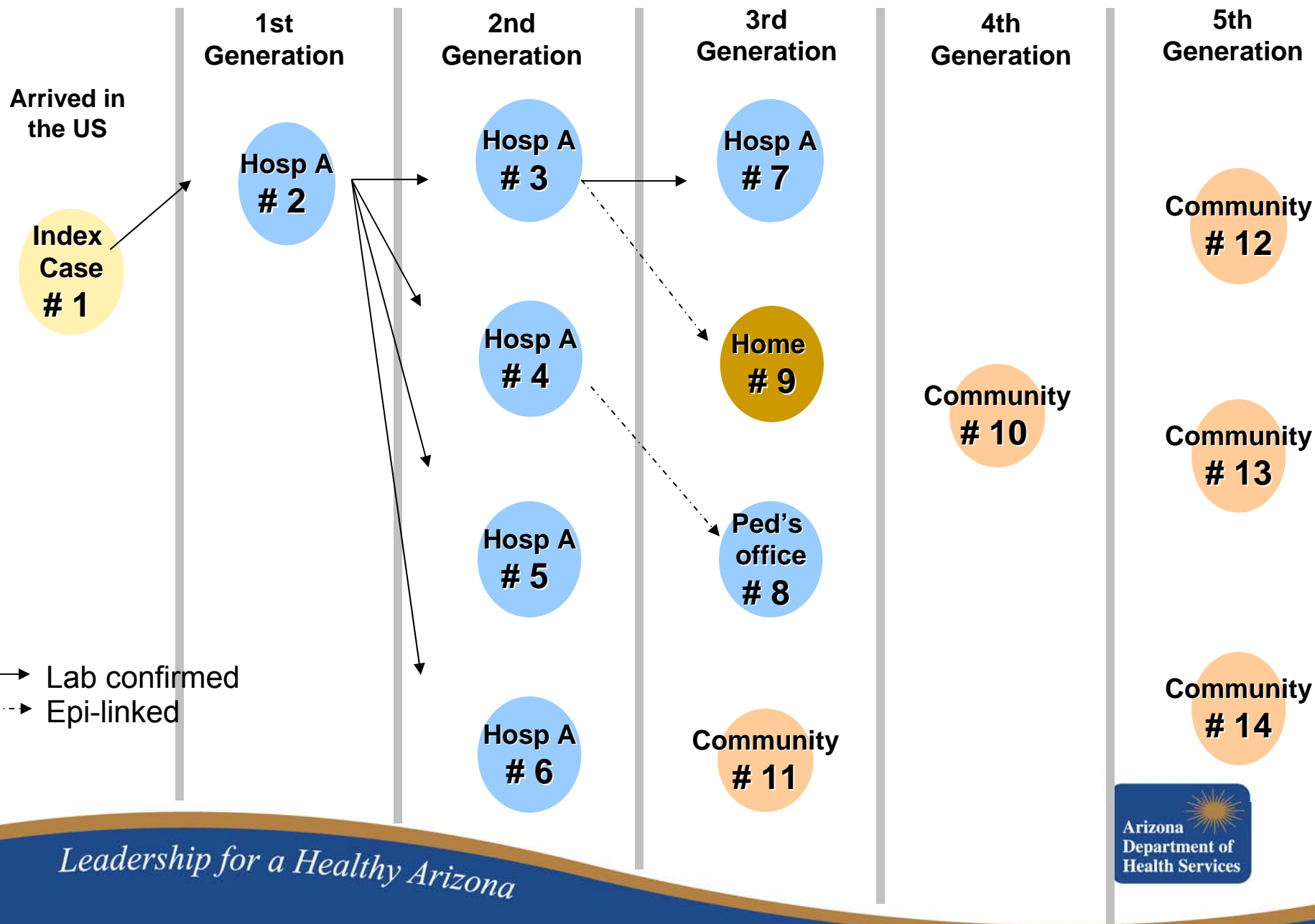
U.S. Vaccination Recommendations

- Two doses
 - All children:
 - 1st dose 12–15 months
 - 2nd dose 4–6 years before a child enters Kindergarten or 1st grade
 - Students in post high school educational facilities
 - International travelers \geq 12 months
 - Health care workers# (HCW)
- One dose
 - Infants 6-11 months traveling abroad
 - Other adults

Measles in AZ

- Index Case
 - Traveler from Switzerland
 - Presented in ER at Hospital A two times
 - Never isolated or placed in airborne precautions
 - During the middle of flu season
 - 3,720 of initial exposures / more than 8,000 total contact investigations

Measles Cases by Generation 2008



Outbreak Vaccine Recommendations

- 1 dose for infants under 12 months of age
 - Early doses did not count as one of the two to fulfill normal vaccination requirements
- Accelerated 1 to 4 year old doses
 - 2nd dose accelerated to 4 weeks after 1st dose
- Required healthcare workers to supply documentation of immunity, even if born before 1957
 - Hospital A had 421 employees (22%) with no documented measles immunity
 - Approximately 42% of these were born before 1957

A Growing Issue

- Existing vaccine clinics were used to vaccinate all people at risk
 - Healthcare workers without documentation of immunity
 - Contacts unsure of immunity status
 - At risk populations
- Number of people in need of vaccination began to overwhelm the existing public health infrastructure

A Growing Issue

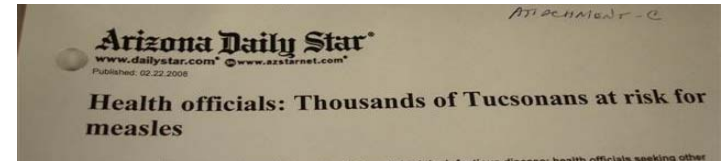
- Media attention
- Communitywide concern
- Strain on Local HD resources
- Other problems faced by Local HD
 - Difficulty vaccinating sheer number of contacts uncertain of their vaccination status
 - Threat of community spread

A Growing Issue

- Additional action taken

- Mass Vaccine Clinics

- Open to public
 - 3 locations in regional area
 - Open air clinic, suspect rash cases could be vaccinated as well in special area
 - Would enable large number of health care workers to be vaccinated as well
 - Word spread via media throughout community





17,000+ doses later...



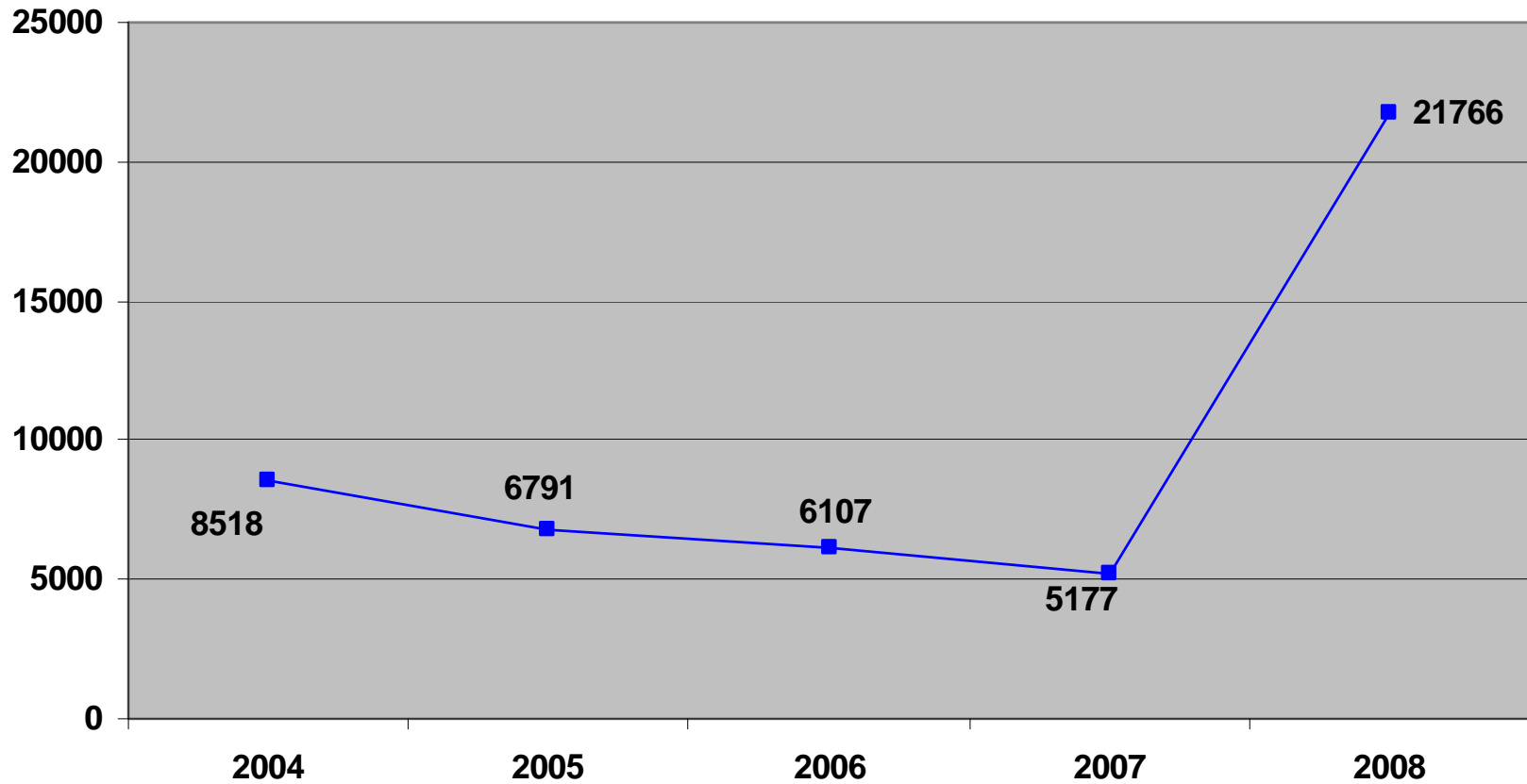
Who Got Vaccinated?

- Local Health Department required to record all vaccine administered during the outbreak
 - Each dose documented and entered into ASIIS, Arizona's electronic immunization registry, regardless of age
 - Normally adults are not required by law to be entered

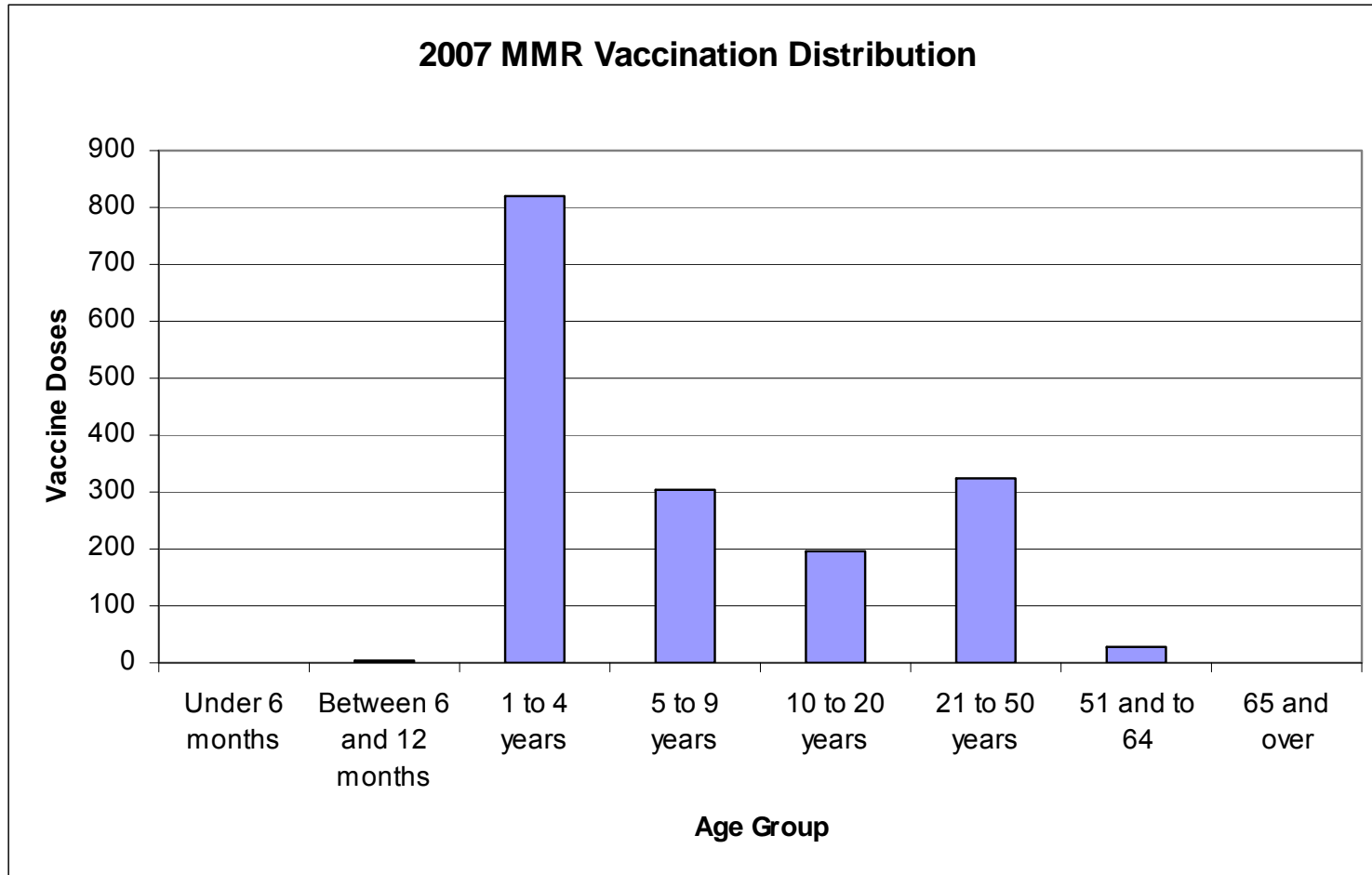
Who Got Vaccinated?

- Compared 2007 Health Department Vaccination Data with 2008 Health Department Vaccination Data
 - Only looked at doses given directly by the health department for both years
 - Doses from other providers excluded to keep data comparable
 - Looked at entire course of the outbreak (February 19th – July 21st)
 - Data queried on 11/13/2008

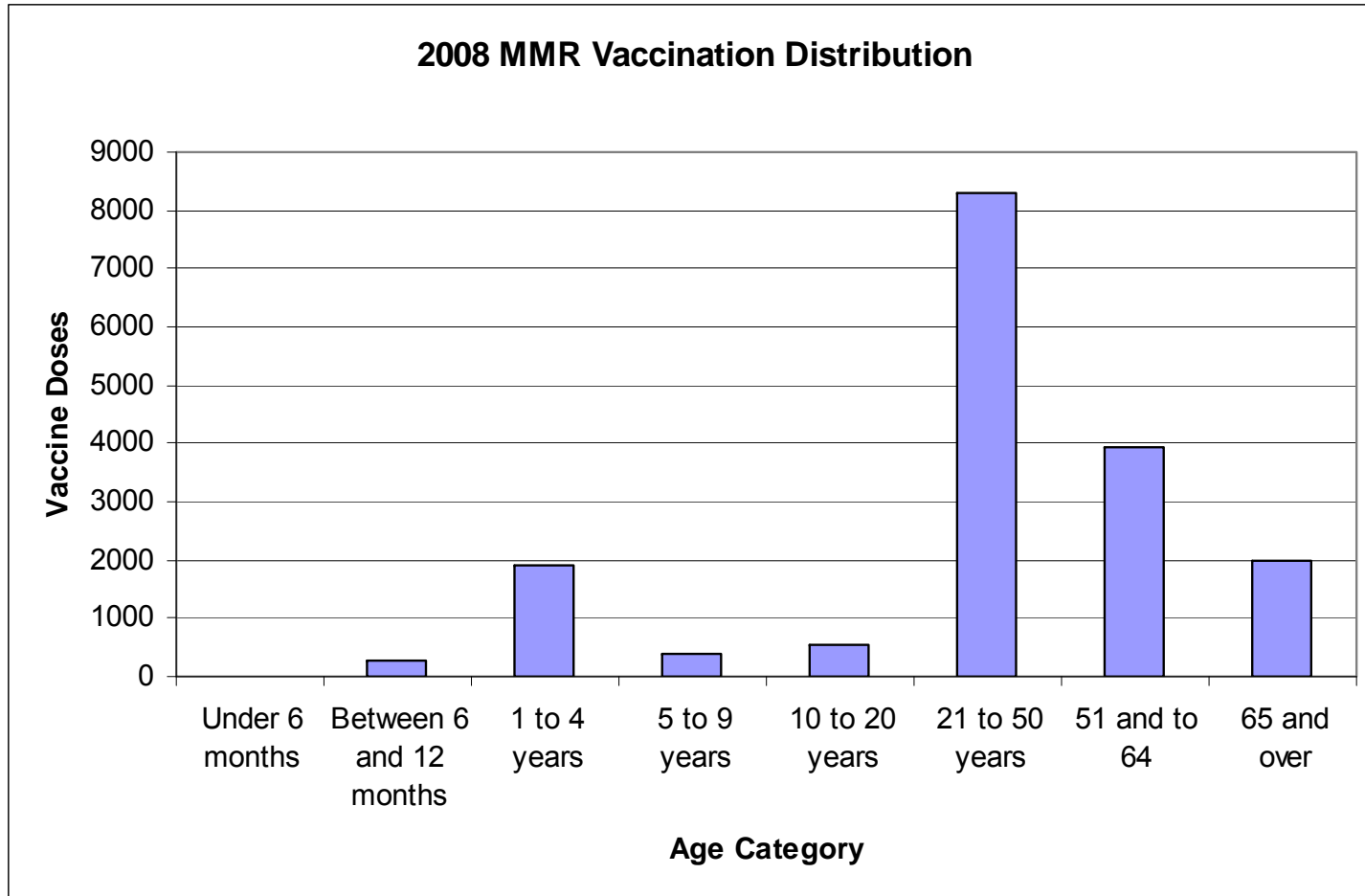
Measles/MMR Administered and Reported by Pima County Health Department 2004 - 2008



Who Got Vaccinated?

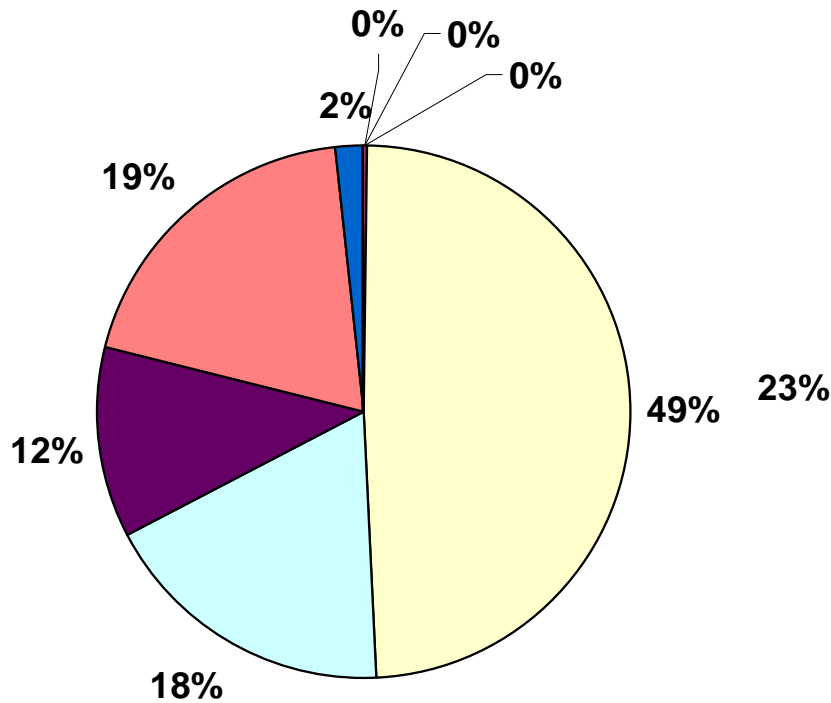


Who Got Vaccinated?

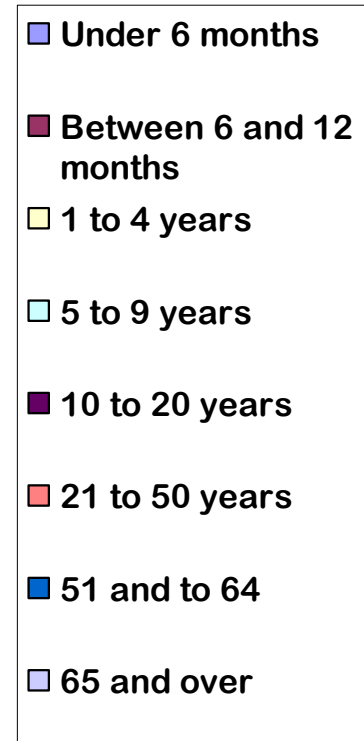
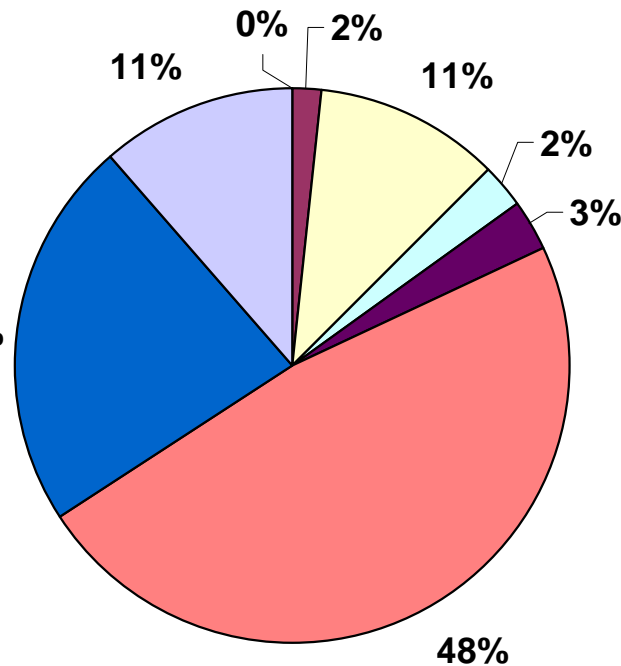


Who Got Vaccinated?

2007 MMR Vaccine Distribution



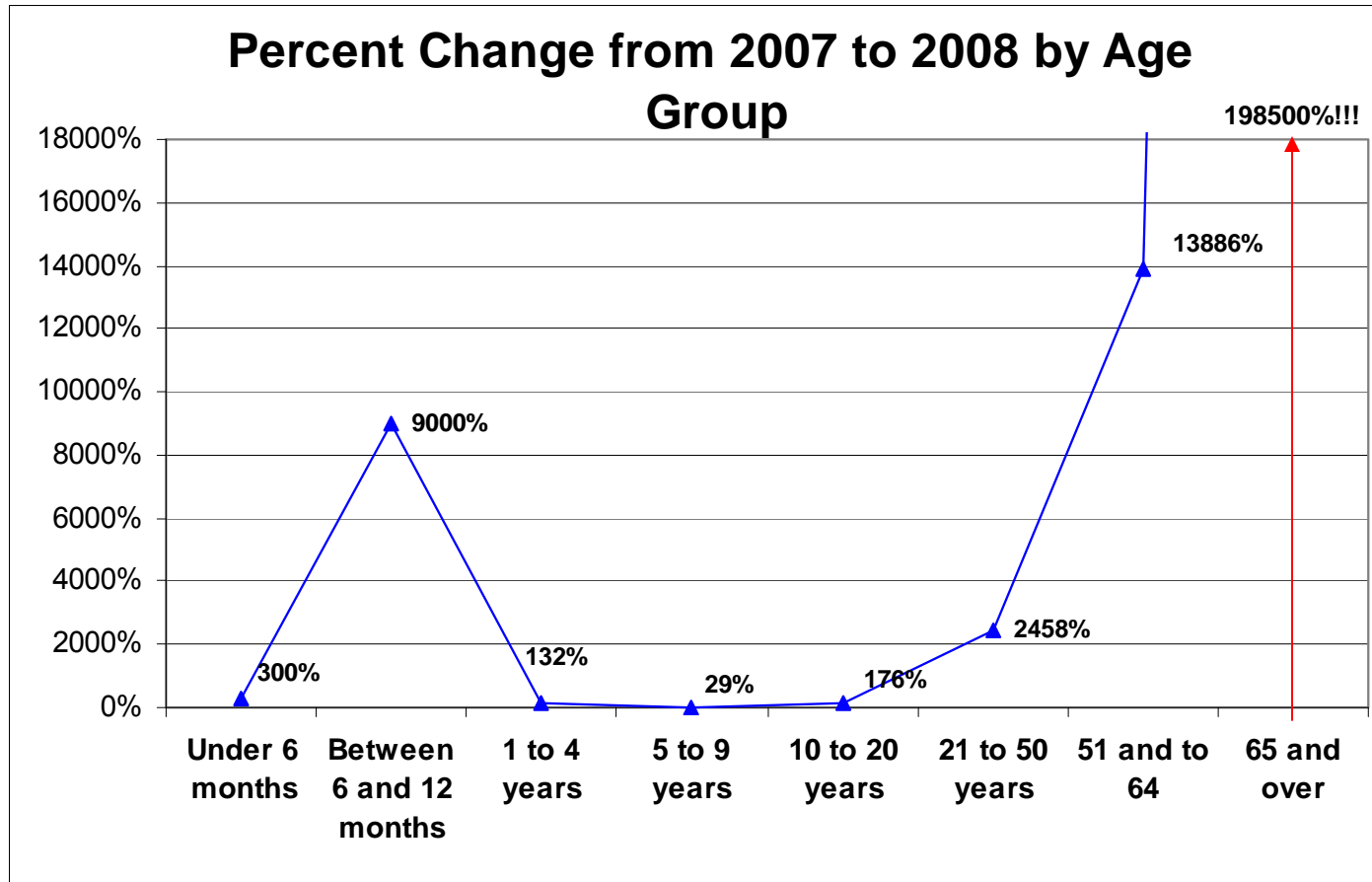
2008 MMR Vaccine Distribution



Who Got Vaccinated?

	2007	2008	Increase
Under 6 months	2	8	4x
Between 6 and 12 months	3	273	91x
1 to 4 years	819	1904	2.3x
5 to 9 years	304	393	1.3x
10 to 20 years	195	538	2.8x
21 to 50 years	324	8289	25.6x
51 and to 64	28	3916	140x
65 and over	1	1986	1986x

Who Got Vaccinated?



Observations

- 1,986 doses were given to adults over the age of 65
 - Most of these people were likely immune to measles, per the ACIP Guidelines
 - Unlikely to be high risk
 - Cost of over \$36,000 in vaccine alone
- 273 infants between 6 and 12 months vaccinated by clinics
 - Infants that would have otherwise had no immune protection
- Total estimated cost of the outbreak was over two million dollars

Discussion

- Why were adult vaccinations so abundant?
 - Healthcare Workers (21 – 50 demographic, maybe some of the 51 – 65 group as well?)
 - Exposed contacts unsure of vaccination status
 - Concerned adults

Limitations

- Possible reporting lag in ASIIS
 - Not all doses may have been entered at time of data pull (lost, delayed, etc.)
- Data completeness
 - Distribution of vaccine given by private providers not accounted for
 - Adults not required to be entered
- No true measure of immune status
 - Vaccination history and antibody titer information not available

Conclusions

- Mass vaccination of the general population is not practical
 - No epidemiologic evidence shown by this study
 - No cost-benefit of mass vaccination shown
 - Consistent with previous studies
 - Many doses used on people who likely did not need them

Conclusions

- Vaccination interventions must be specifically targeted
 - Use epidemiologic data to target vaccination efforts
 - Resources are limited in outbreak responses
 - Risk is not evenly distributed across the population
 - Public health messaging must be specific
 - Concentrate on those truly at risk
 - Create both awareness and reassurance
 - Balance public demand for action and the true cost benefits of vaccination

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* Authors

Questions?

Caleb Wiedeman

Epidemiologist, AZ Dept. of Health Services

wiedemc@azdhs.gov

(602) 364-3676

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Vaccination Rates

Vaccination Rates by Age Group for 2007 and 2008 during the Outbreak Period (per 100,000 population)				
	2007	95% Confidence Interval	2008	95% Confidence Interval
<1	119.7	(62.8 - 176.5)	2112.7	(1867.4 - 2358.0)
1 to 4	1451.1	(1351.0 - 1551.2)	3382.2	(3230.1 - 3534.3)
5 to 14	305.2	(275.3 - 335.1)	475.9	(438.7 - 513.1)
15 to 24	91.7	(76.2 - 107.2)	607.0	(567.2 - 646.7)
25 to 54	75.8	(67.3 - 84.3)	2201.2	(2155.6 - 2246.8)
55 to 64	11.1	(4.8 - 17.4)	2434.5	(2341.9 - 2527.1)
65 and up	0.7	N/A	1341.7	(1282.7 - 1400.7)