Family Reunification after Disasters

Sarita Chung, MD, FAAP
Assistant Professor of Pediatrics, Harvard Medical School
Member of Disaster Preparedness Advisory Council
American Academy of Pediatrics

Boston Children's Hospital
Until every child is well

HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

Conflict of Interest Disclosure

- I have no financial relationships with a commercial entity producing healthcare-related products and/or services.
- Images used in this presentation were obtained from the public domain of the internet.

Objectives

- Discuss the importance and challenges of family reunification planning
- Present the current systems/resources available
- Describe results from family reunification research at Boston Children's Hospital
- Think about next steps

New York City: September 11th, 2001

Nearly 3,000 dead

- 2,814 missing.
- Today, there are about 90 still

http://news.bbc.co.uk/2/hi/8510900.stm

http://www.unicef.org/publications/files/UNICEF_HAR_2010_Full_Report_EN_020410.pdf

Hurricane Katrina August 2005

- Over 5,000 children separated from their families
- Final reunification 7 months later

Would we do a better job today?

Newsweek

Overlooked: The Littlest Evacuees
Oct 6, 2008

Within hours of hurricane Ike's landfall in Texas, San Antonio, officials had compiled precise statistics about their evacuee situation. They knew the city would need to care for 5,303 people (561 of whom had special medical needs) and 642 pets, including a turtle named Nibbles. But there was one key group for which they had no figures: children.

"No one knew how many", says a staff member.

Need for School Reunification Plans

- Estimated 55 million children in schools and child care facilities during the day
- Integration in local emergency management planning

Ice storm 2014 Atlanta Georgia

Closer to Home- Boston Marathon Bombing

HOME / NEWS / LOCAL / MASSACHUSETTS

The Boston Globe

Boston hospitals confronted challenges in identifying patients after Marathon bombing

Chief among concerns: accurately identifying patients amid chaos

- One hospital, family led to the wrong patient
- One mother had walked to 3 different hospitals before finding her child

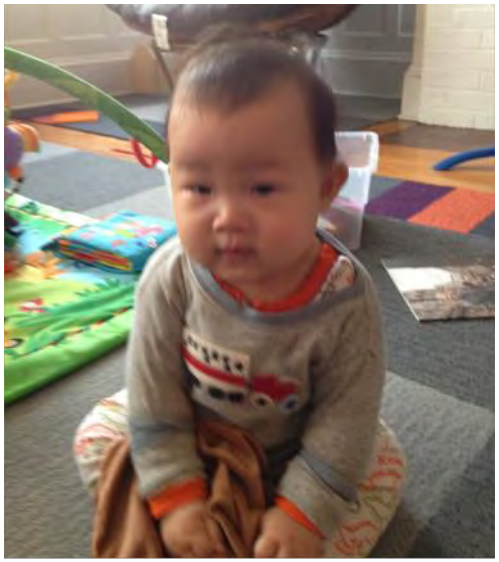
How do hospitals work with local and regional emergency planners in reunification?

Reunification is Needed

- *"Improved methods for reunifying separated children with their families"*
- *"Develop a standardized interoperable national evacuee tracking and family reunification system that ensure the safety and well-being of children"*

Challenges of Children regarding reunification

- Developmental
  - May not self-identify
  - Immature Cognitive Skills
- Mental Health
  - Increase risk of mental health disorders
- Safety
  - Child safety and protection
  - Escalation of staffing
  - More space

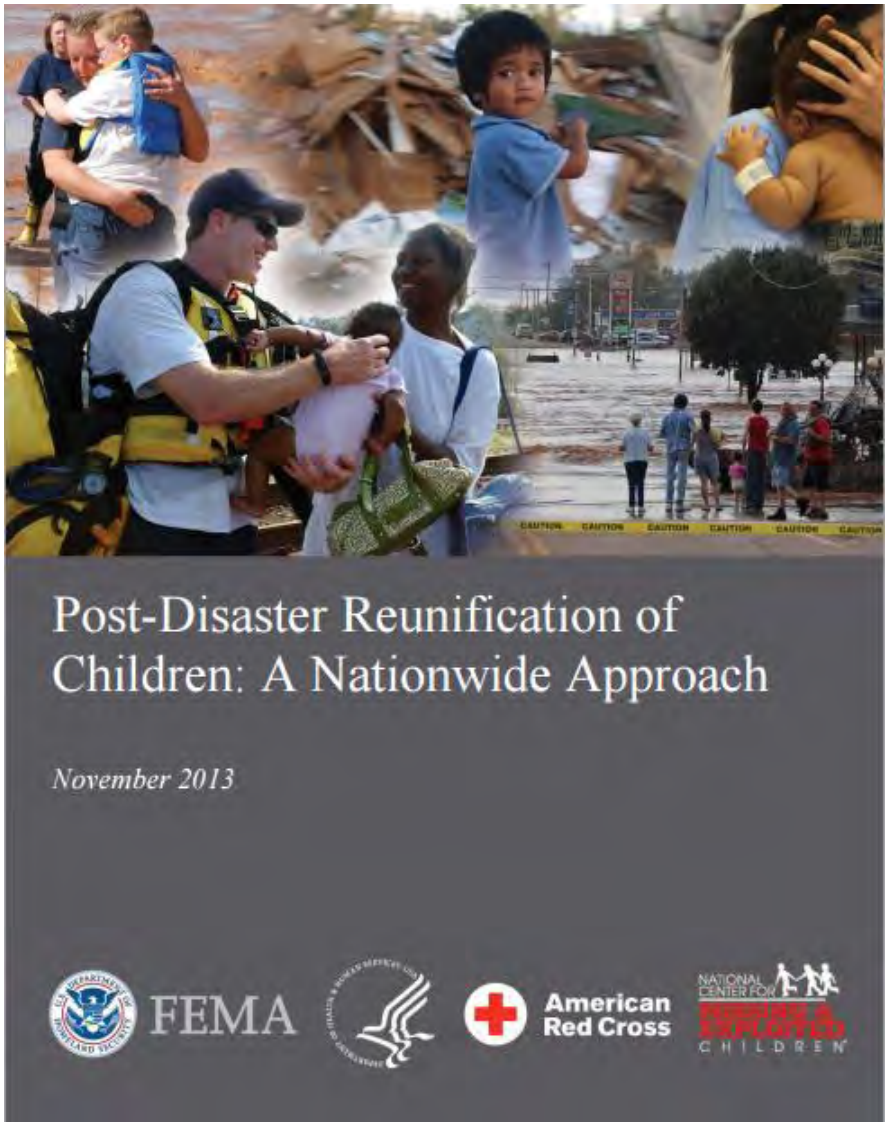


Parents after Disasters

- May disregard everything until reunited with their family
  - 63% of parents would disregard an evacuation
- FASTER FAMILY REUNIFICATION = EARLIER RECOVERY

Current Sysems and Resources Available

National Level- Federal Resource



- Support overall reunification processes and procedures
  - Identifying roles of lead and supporting agencies
  - Enhance/develop reunification elements in emergency preparedness plans
  - Approach for schools, shelter and hospitals

National Level –Federal Resources

- Federal Emergency Management Agency
  - National Emergency Family Registry And Locator System
  - National Mass Evacuation Tracking System (radio frequency identification)
- Department of Health and Human Services
  - Joint Patient Assessment and Tracking System

National Level- NGO

NATIONAL CENTER FOR MISSING & EXPLOITED CHILDREN®

www.missingkids.com

- National Emergency Child Locater Center
- Unaccompanied Minors Registry
- Team Adam
  - Deployment of retired law enforcement officials

National Level- NGO

American Red Cross

- Safe and Well website
- Communicate with law enforcement and child welfare agencies
- Track movement through Unaccompanied Minors Report Form
- Designates 2 people to supervise an unaccompanied minor

State Level

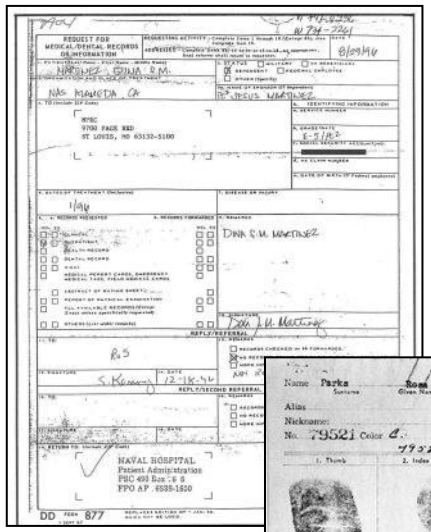
- New York State Operation Safe Child

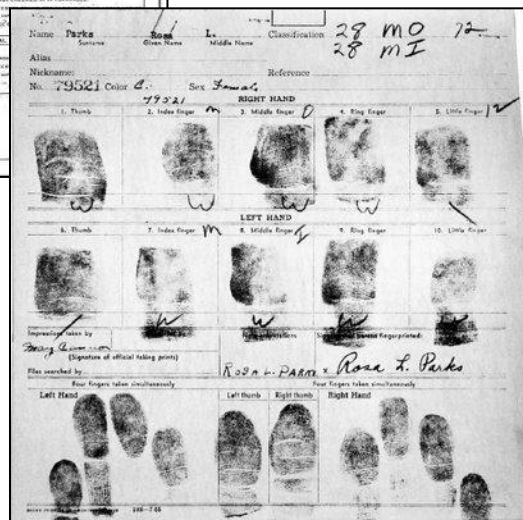
- Louisiana – Phoenix Tracking System
  - Coded arm bands

Local Level

- No standardized approach
- Need for the whole community involvement for planning
- For the deceased
  - Local dental records
  - Local Police Department

  DNA/finger printing programs





Social Media

What's currently available?

- Facebook, Twitter, etc
- Local News (Google, CNN, etc)

Shortcomings

- FEMA National systems are not in use unless a Federal disaster is declared
- Local system may not be scalable or remotely accessible
- Social Media require that you are alive, have internet access, and are literate

Does not address

People who can not access the system:

- Young Children (pre-verbal)
- Children with Special Healthcare Needs
- Severely Injured
- Deceased

Family Reunification Research

Funded by HRSA (EMS-C Targeted Issues) Grant #H34MC10575-01-01

REUNITE: Image Based System

Chung *Am J Disaster Med* 2007 May-Jun;2:113-117

Chung *Acad Emerg Med* 2012:19:1227-34

Where Can this System be Accessed?

Hospitals

Healthcare Centers

Relocation Shelters

more

Emergency Responder Survey (n= 129)

System Design Features

Selecting which pictures to show parents (N=129)

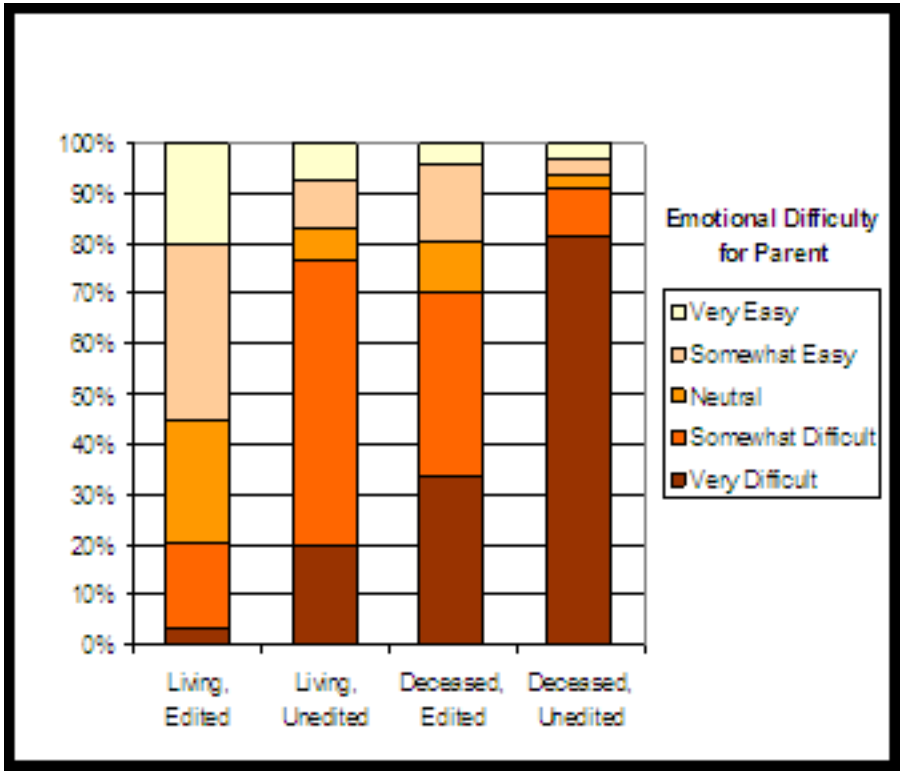
Only show if all search characteristics match	23	(18%)
Show if most characteristics match	**70**	**(54%)**
Show if some characteristics match	23	(18%)
Do not attempt matching; show all pictures	13	(10%)

What system would be most useful? (N=127)

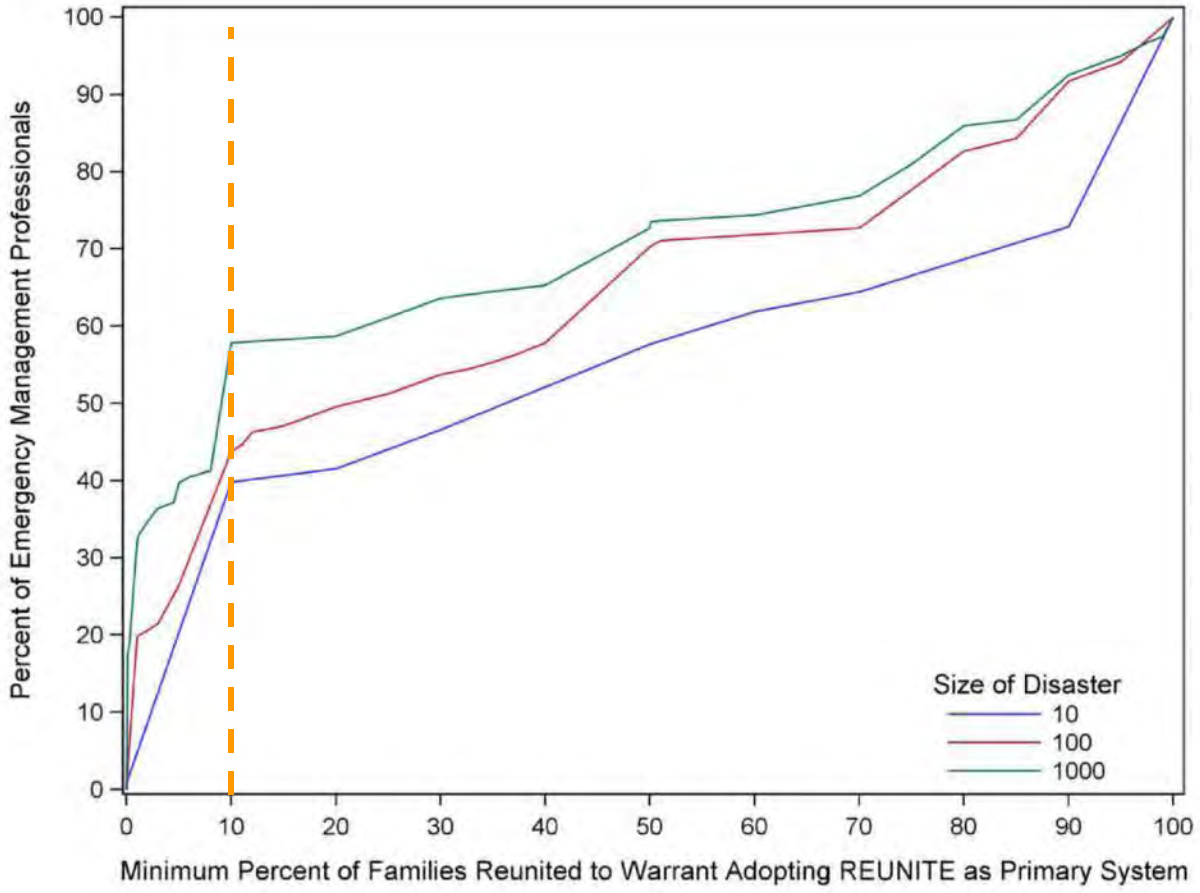
Unedited pictures of living and deceased	**58**	**(46%)**
Unedited pictures of living; edited of deceased	50	(39%)
Edited pictures of living and deceased	19	(15%)

Emotional Difficulty for Parents in viewing child's photographs

Emergency Responders



Minimum Number of Reunifications



In a large scale disaster, If REUNITE could reunify 10% of families, over half of Emergency Responders would adopt REUNITE as a primary system.

Development of the REUNITE Prototype

REUNITE Facial Feature Extraction

Skin

- Divided in 2 categories
- Grouping of Light/Dark

Eyes

- Divided in 2 categories
- Grouping of
  - Blue/Green/Grey &
  - Hazel/Lt & Dk. Brown

Age

- 0-12 month
- 13-23 months
- 2-4 years
- Over 5 years

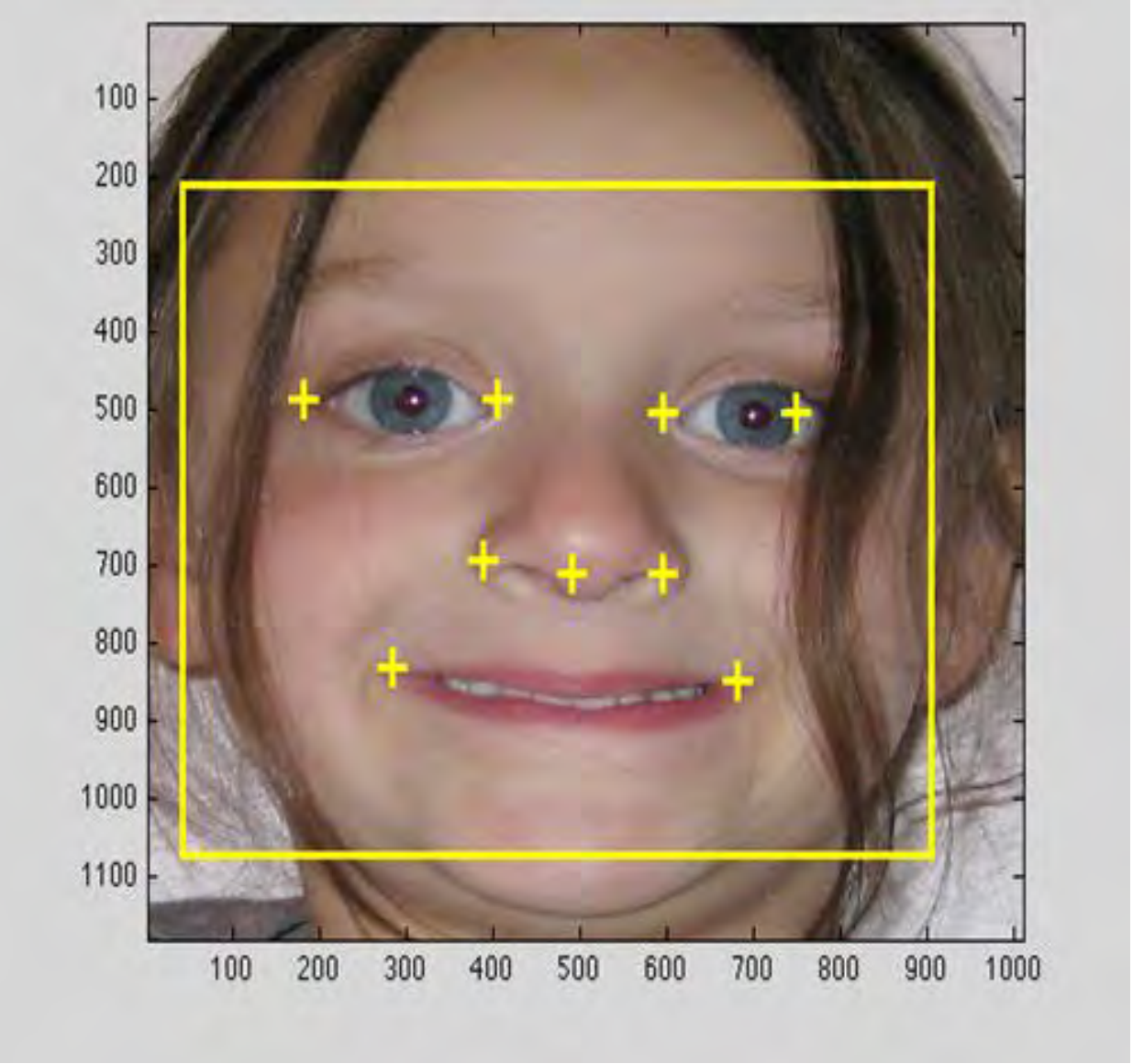
GENDER

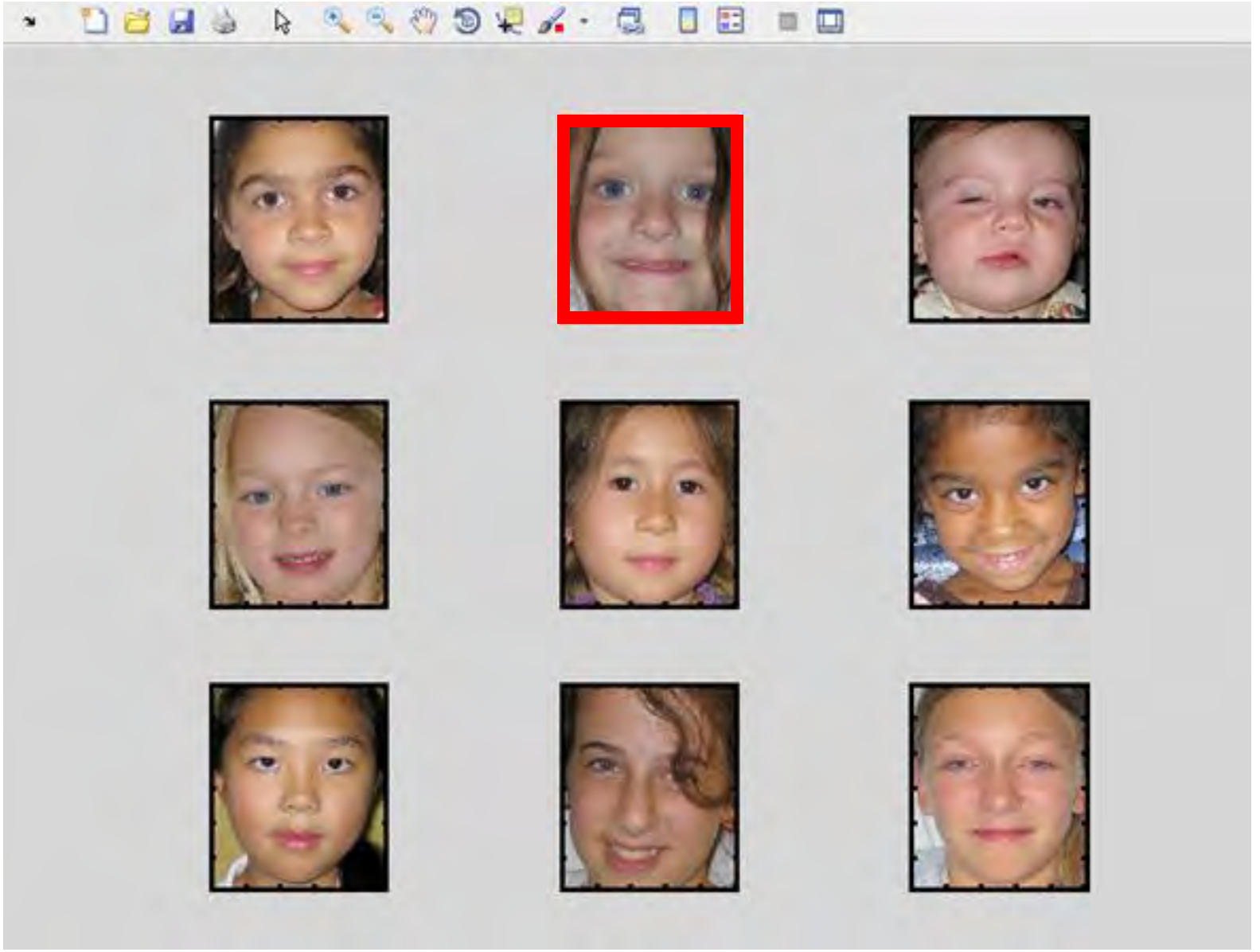
- Male
- Female

Similarity (Browsing) Function

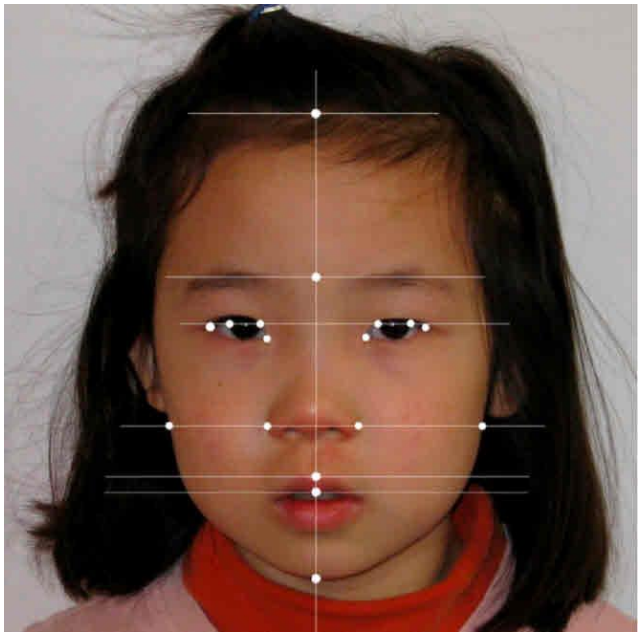
- Parents can choose photos that look their child
- Database is reordered to display photos that have similar features (facial shape, hairstyle)
- Advantages
  - Large scale disaster
  - Homogenous populations

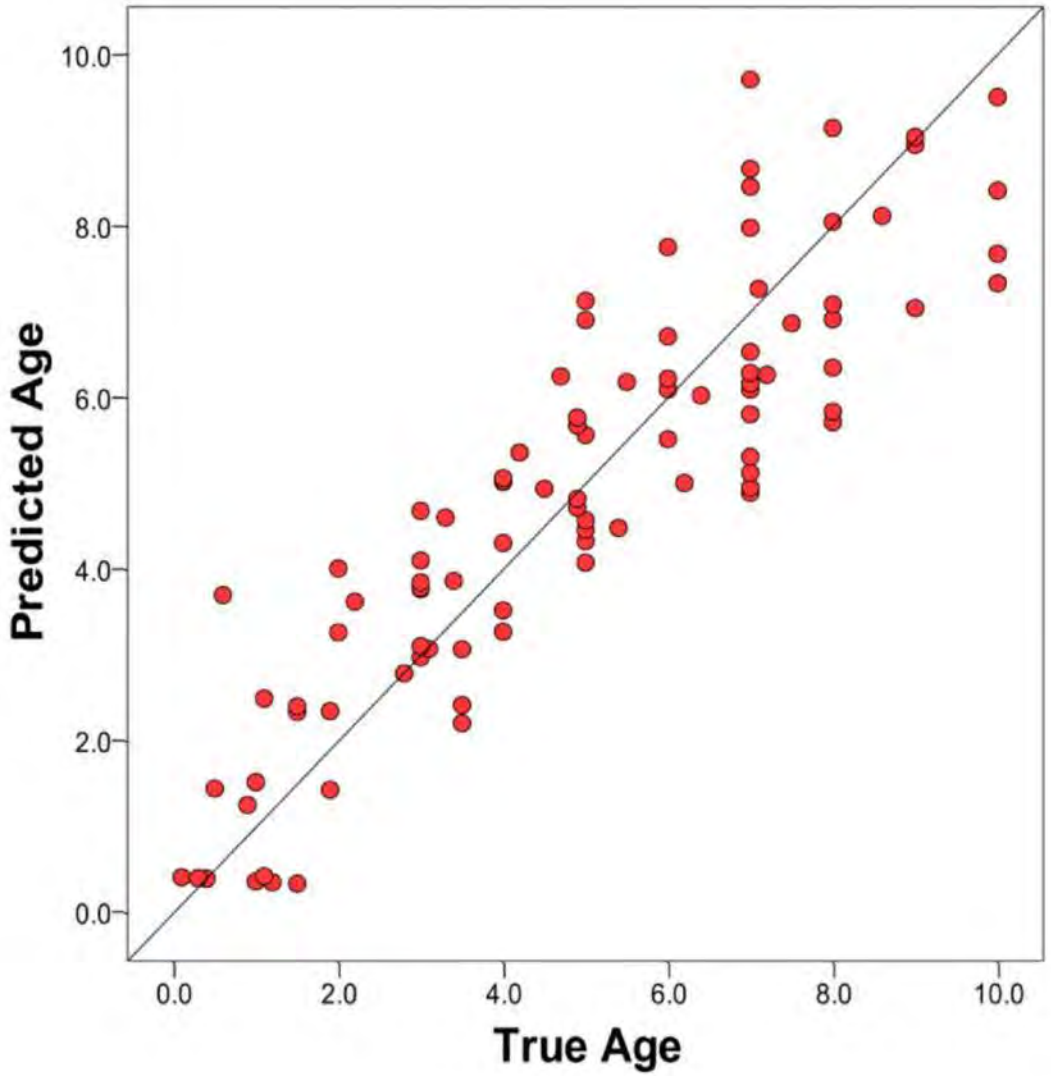
Missing Child





Estimation of Age





Boston Children's Large-Scale Disaster Drill

Drill Scenario

- **Scenario**: Category 4 Tornado in MA impacting several schools and one day care, all in session. About 1,200 children affected and are being transported to different area hospitals.

- **Drill Assumptions**: Children were brought to the hospital without their parents; were medically evaluated and discharged to the Pediatric Safe Area. Children participating were unable to provide any personal information

Large Scale Drill:
Boston Children's Reunification Protocol

Pediatric Safe Area- converted conference room

Success

- Multidisciplinary roles in creation of protocol- emergency management, social work, child life, pyschiatry, emergency department
- Age appropriate "pediatric safe area"
- Established parent/child verification process

Gaps Identified

- Needed dedicated pediatric "quiet space"
- Further training needed

Family Vetting Forms

Contact number:	617 869
Family's address:	BROOKLINE, MA 02446
Child's Name(s) and MR# (or Drill ID#):	RENATA SHEN CALDER SHEN
Patient Identifiers: Hair Color	BLACK
Eye Color	BROWN
Clothing	T. SHIRT/SHORTS - RENATA KIDS DRESS - CALDER
Shoes	
Jewelry	NONE
Other	RENATA WEARS GLASSES CALDER HAS A DBL BRAID
Name of School and/or Grade:	DRISCOLL SCHOOL K-8 RENATA 3RD (GOING ON 4TH) CALDER (GOING ON TO KINDERGARTEN)
Name of Teacher:	PHOEBE JONES ALEX CAMPBELL
Pets – Type of Animal(s) and Name(s):	

Name: Renata	**Age:** 8
Mother's Name: Sarita	**Father's Name:** Hau
Brother(s) and/or Sister(s) Name(s) and Age(s): Caitlin/Calder – 5	
Pets – Type of Animal(s) and Name(s): ∅	
Name of Town: Brookline	**Name of Street:** [redacted] James St
Name of School and/or Grade: Driscoll 3rd - 4th in fall	**Name of Teacher:**
Phone Number: 617-869-	**Child's Drill ID (for staff)** ✓ 3B

Name: Calder	**Age:** 5
Mother's Name: Sarita	**Father's Name:** Hau
Brother(s) and/or Sister(s) Name(s) and Age(s): Renata - 8	
Pets – Type of Animal(s) and Name(s): ∅	
Name of Town: Brookline	**Name of Street:** Jam
Name of School and/or Grade:	**Name of Teacher:**
Phone Number: 617-869-	**Child's Drill ID (for staff)** ✓ 3A

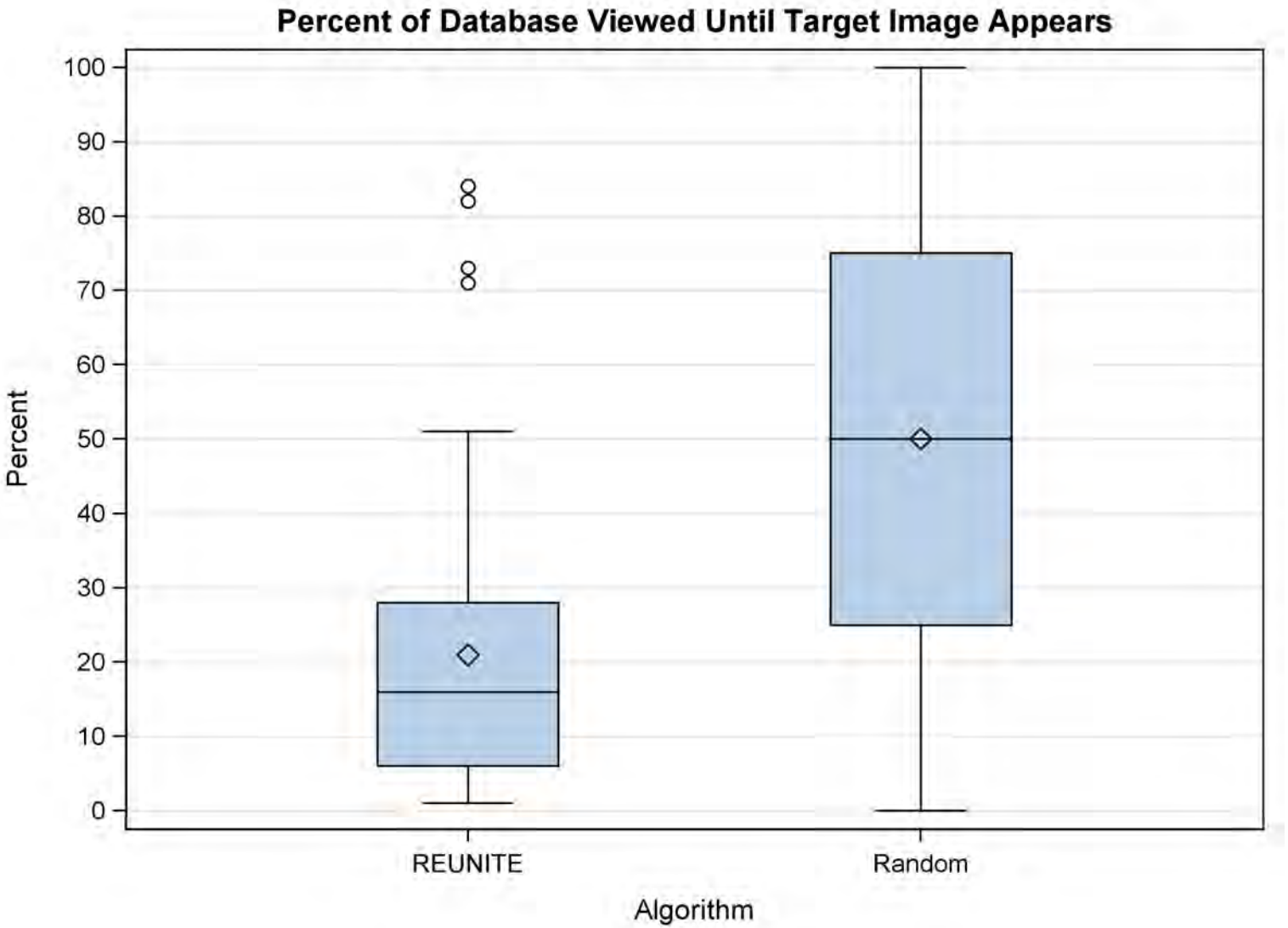
Participant Characteristics

- 22 Families
- Parents
  - 28 Parents/Guardians
  - 97% 4 year college degree or more
- Children
  - 49 children participated
  - 41% searches for children <5 years of age

Accuracy of Facial Attributes

	Concordance between Parent and Tool (%)	Kappa
Skin Color	95%	.64
Eye Color	71%	.39
Age	60%	.39
Gender	75%	.44

Performance



Time to Identification

- Time until child appears on the screen(minutes): 5.6 (±5.5)
- Time to reunite parent with their child (minutes): 46(±12)
- However, **parents missed identifying their child** 9.5% of the searches!
- In addition, parents were stressed

Next Steps

Let's Talk: Planning for Family Reunification

- Encourage individual and family preparedness
- Develop/enhance reunification plans: who is at the table?
  - Emergency Management and EOCs
  - Child Welfare Agencies
  - Law Enforcement
  - School System
  - Corners/Medical Examiners
  - Healthcare (Pediatricians)
  - Volunteer Organizations

Let's test: Family Reunification Plans

- Use children in drills
- Understand and mitigate barriers
- Drill the entire process from separation to reunification in the whole community
- Don't be afraid if your assumptions were wrong

Future Research

- Leveraging social media for child identification
- Better image based family reunification system using voice and video recognition
- Best practices family reunification plans
- Other biometrics systems
- ……

Thank You