

The Autoimmunity Screening for Kids (ASK) Study: Screening Expansion

303-724-1ASK | ASKhealth.org
1 2 7 5

Autoimmunity Screening for Kids
ask 
FREE
A SIMPLE TEST TO DETECT
Childhood Diabetes + Celiac

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Autoimmunity Screening for Kids
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A SIMPLE TEST TO DETECT
**Childhood Diabetes
+ Celiac Disease**

Objectives

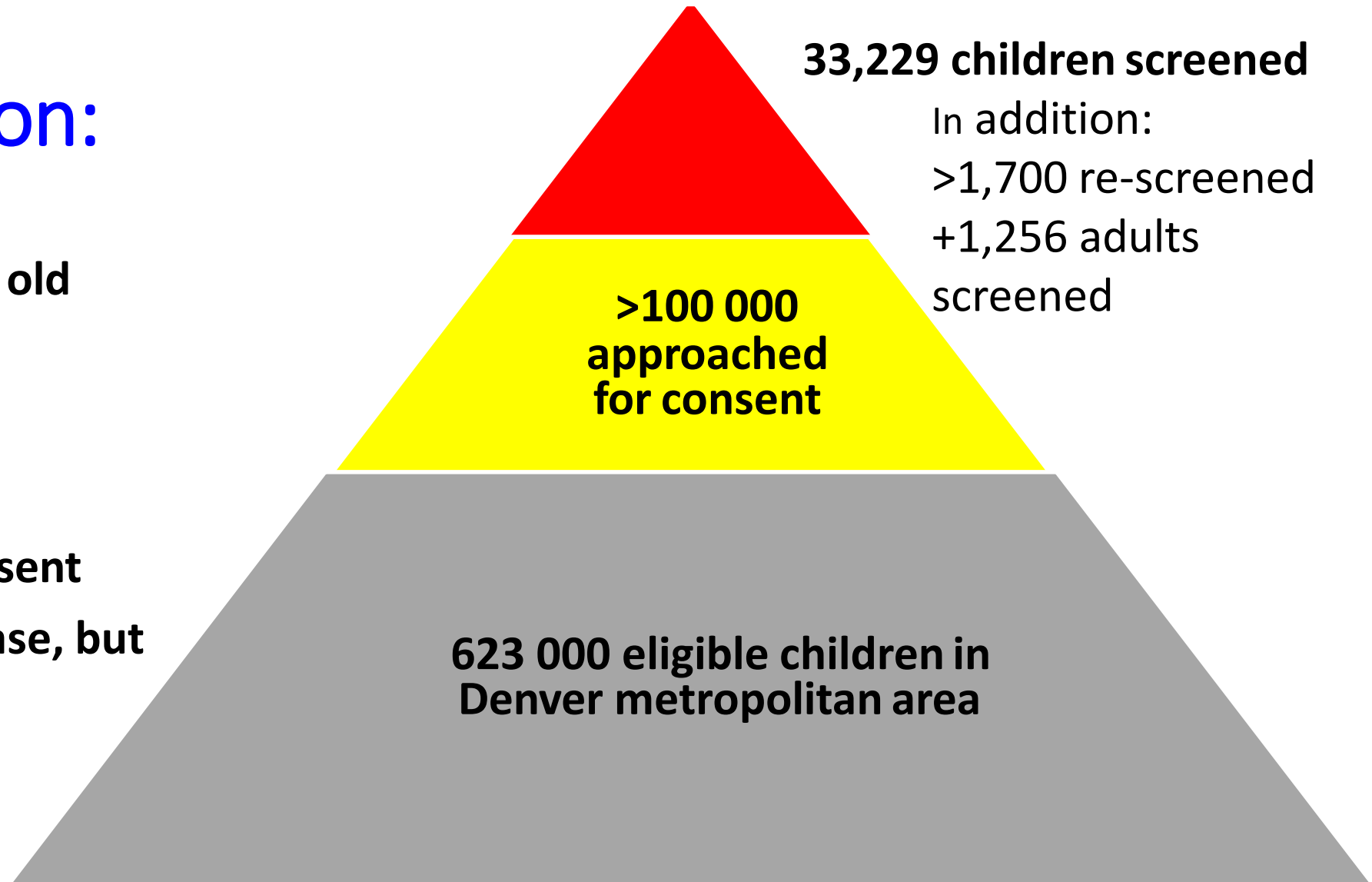
- 1. Highlight findings from the Autoimmunity Screening for Kids (ASK) study to date**
- 2. Provide an update on screening for early-stage type 1 diabetes**
- 3. Share information on future directions for general population screening**

Autoimmunity Screening for Kids (ASK) Goals:

1. Determine frequency of pre-symptomatic T1D and celiac disease
2. Prevent diabetic ketoacidosis (DKA) at diagnosis of diabetes
3. Offer interventions to slow progression to diabetes
4. Reduce complications of undiagnosed celiac disease
5. Analyze cost-effectiveness of screening -> universal screening?
6. Increase community awareness

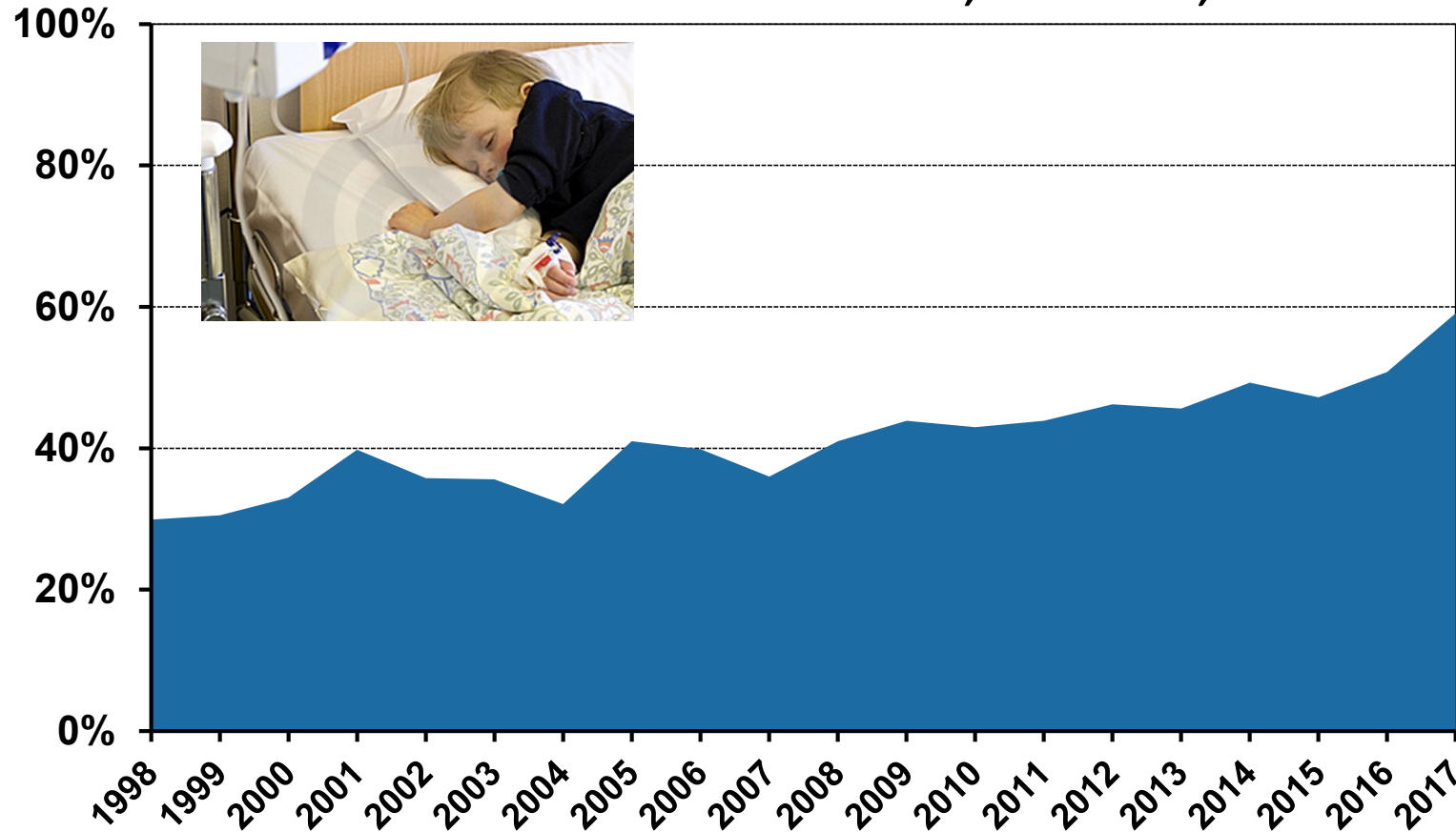
ASK Population:

- Children ≥ 1 to <18 y old
And now adults
- Reside in Colorado...
And the US
- Parent/guardian consent
- Can have celiac disease, but not diabetes
- 1/2017-10/1/2023



Diabetic Ketoacidosis (DKA) at Diagnosis of Type 1 Diabetes (T1D) is Increasing

Colorado 1998-2017, N=5,788



Potential Outcomes:

- Brain edema
 - Acute neurological impact
 - Permanent neurological damage
- **Risk of Mortality**
- Cost of ED, hospitalization, PICU
- Trauma to the child and family
- Impact on long-term beta-cell capacity

Adapted from: Rewers A et al. JAMA 2015
Alonso T et al. Diabetes Care 2020

Autoimmunity Screening for Kids

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Slide courtesy M Rewers

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Childhood Diabetes
+ **Celiac Disease**

Colorado T1D Prospective and Screening Studies

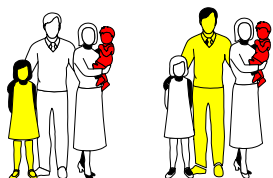
Began 1992

DAISY

General population cohort



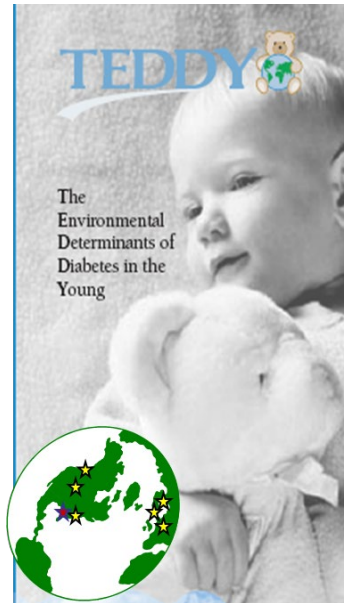
Sibling/offspring cohort



Colorado:

31,881 newborns screened
2,547 general population
and first-degree relatives
followed

Began 2004



Multinational:

424,000 newborns screened
8,677 high-risk children
intensively followed
'omics studies

Began 2004

Type 1 Diabetes TrialNet

Multinational:

> 220,000 relatives screened

Free screening for:

- family members of those with T1D (ages 2.5-45 years)
- anyone found Ab+ outside of TrialNet (2.5-45 years)

Monitoring for relatives with positive Abs

Participation in studies that may stop or slow the progression of T1D (both GP and relatives)

Began 2014

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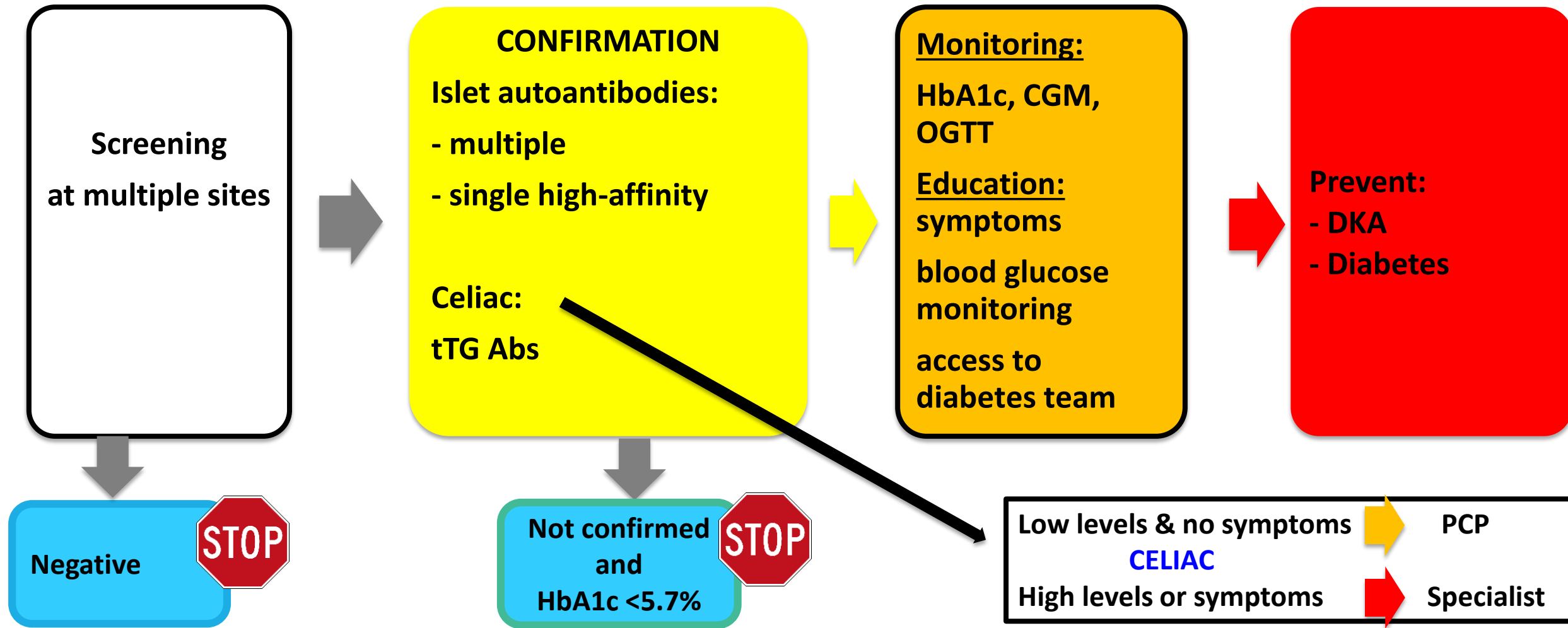
Colorado and the US:

33,000+ general population
children ages 1-17 years screened
islet autoantibody positive
individuals followed and
monitored through ASK or Ask the
Experts national monitoring
program

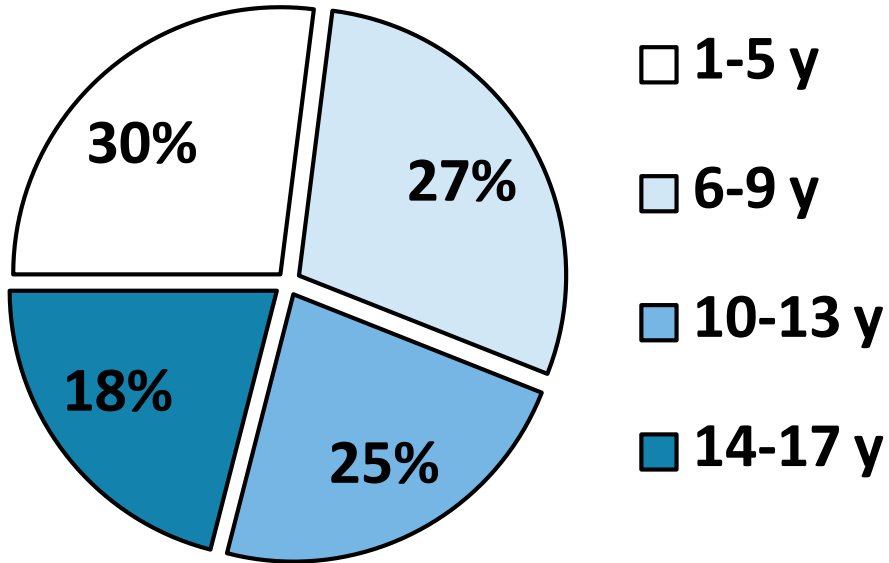
Autoantibody Assays in ASK

	Islet autoantibodies				Celiac	serum
Radiobinding assays (RBA) Detect both high-affinity (predictive) and low-affinity (non-predictive) autoantibodies	IA-2A	GADA	mIAA	ZnT8A	tTGA	44 µL
	IgG only				IgA only	
Electrochemiluminescence (ECL) assays Detect only high-affinity autoantibodies Detects all isotypes IgG, IgA, IgM, IgD, IgE Multiplexed Multiplexed with SARS-CoV-2 antibodies	IA-2A	GADA	IAA	ZnT8A	tTGA	
	IA-2A, GADA, IAA, ZnT8A, tTGA					13 µL
	IA-2A, GADA, IAA, ZnT8A, tTGA, SARS-CoV-2A					

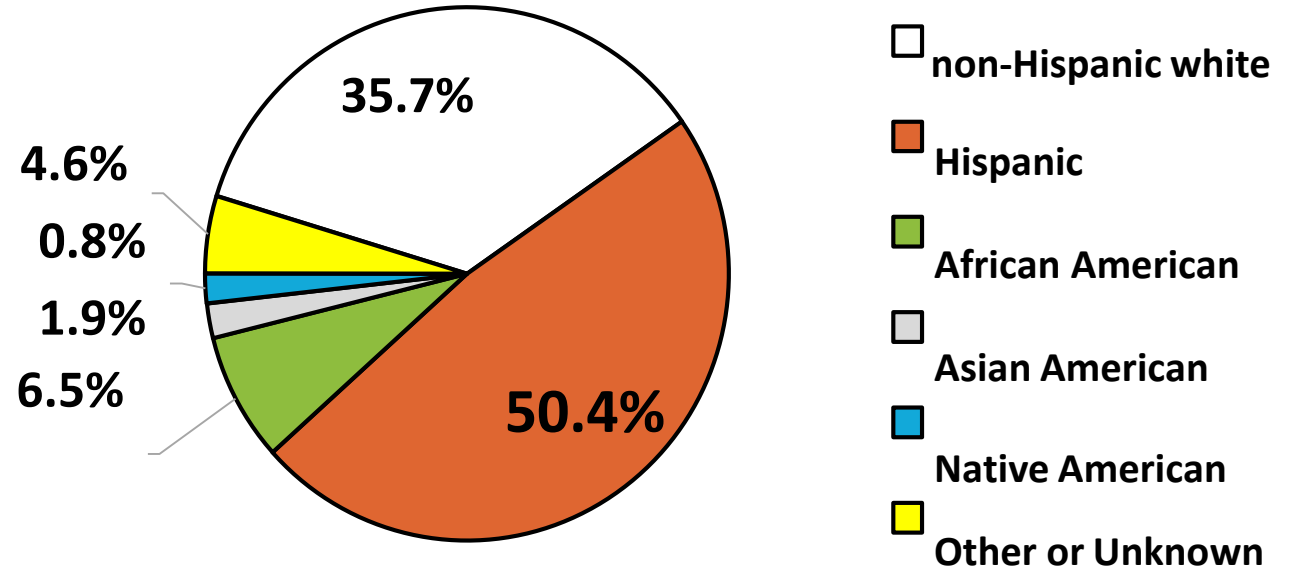
ASK Protocol



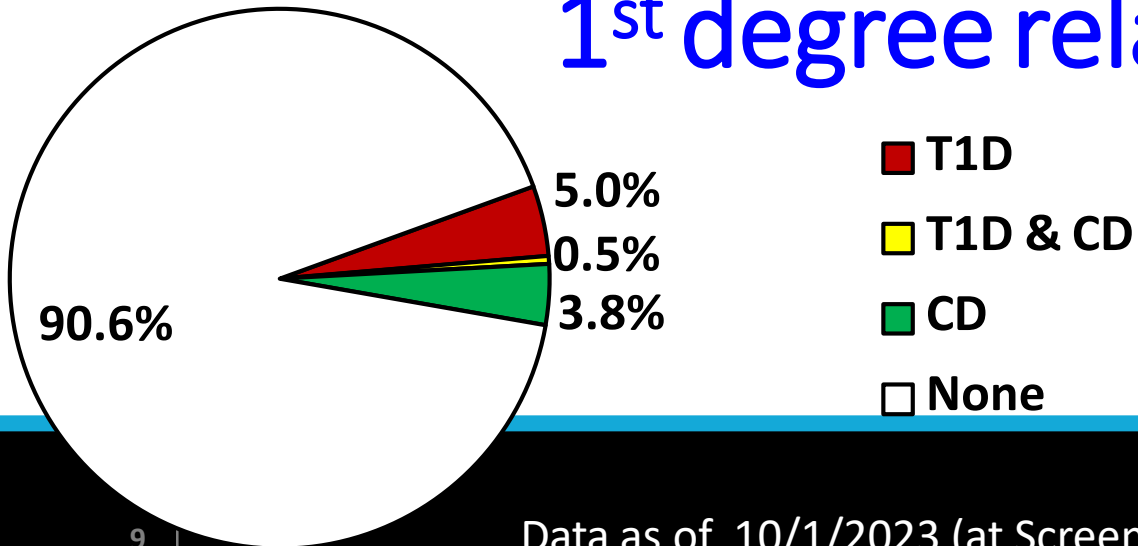
Age distribution



Race/ethnicity

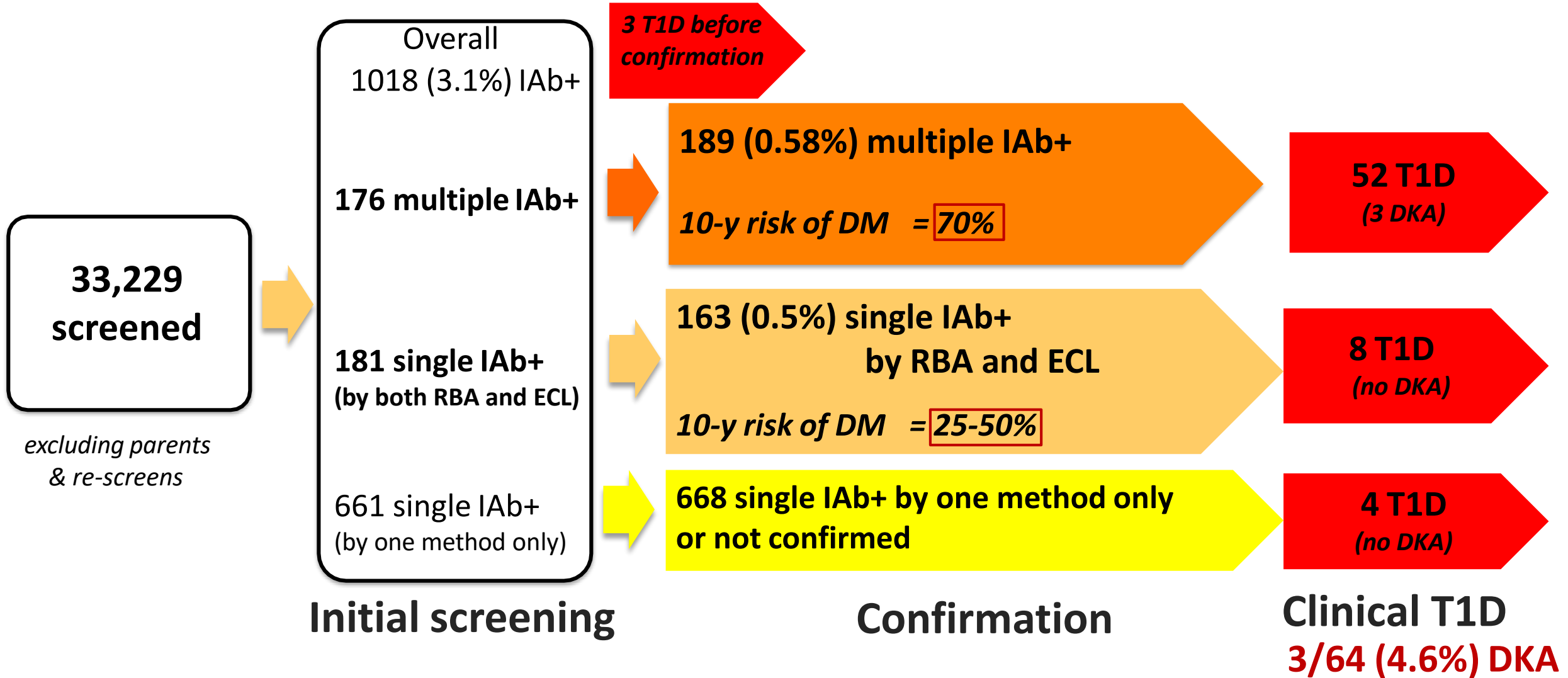


1st degree relative

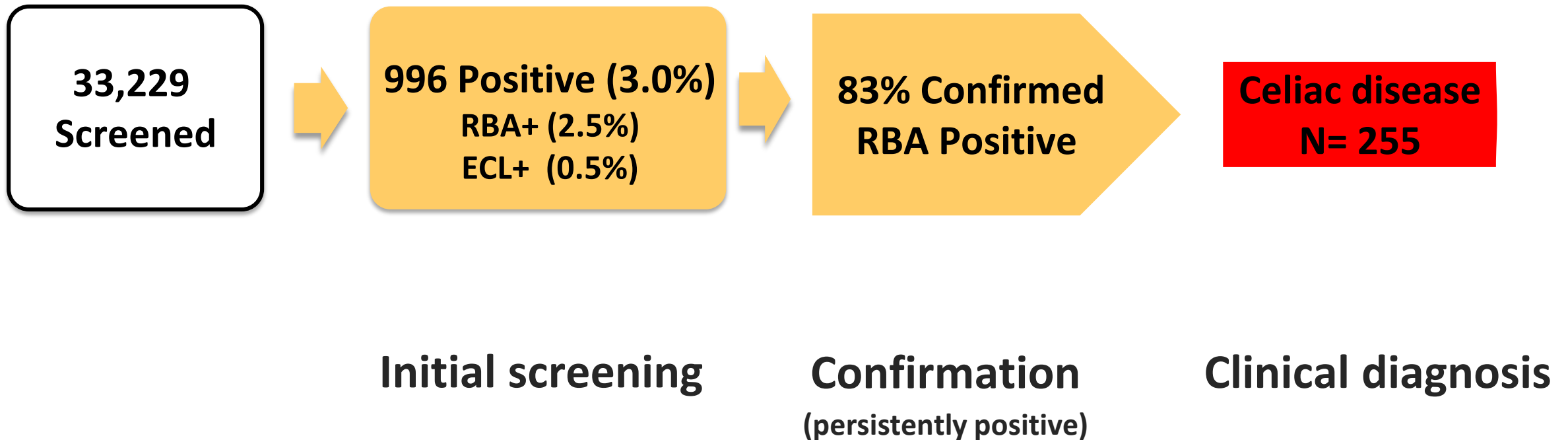


Data as of 10/1/2023 (at Screening)

ASK Results: Islet Autoimmunity and Diabetes



ASK Results: Celiac Autoimmunity and Disease



Autoimmunity Screening for Kids (ASK), 2017-2023

- Screened >33,000 Colorado children 1-17 y old
- Prevalence of pre-symptomatic T1D - 1.0% (95%CI: 0.9- 1.1%)
- Prevalence of celiac disease/autoimmunity - 2.1% (1.9- 2.3%)
- DKA at diagnosis of diabetes <5% vs 62% in screened vs not screened
- Evidence of cost-effectiveness of the screening
- Increased community awareness of T1D and CD

1. McQueen RB, Geno Rasmussen C, Waugh K, et al. Cost and Cost-effectiveness of Large-scale Screening for Type 1 Diabetes in Colorado. *Diabetes Care*. 2020;43(7):1496-1503.

2. Stahl MG, Geno Rasmussen C, Dong F, et al. Mass Screening for Celiac Disease: The Autoimmunity Screening for Kids Study. *Am J Gastroenterol*. 2021;116(1):180-187.

Tips from ASK for general population screening

- The initial screening test has to be sensitive to avoid false negatives and disease-specific to avoid false-positives
- Confirmation at another time point is needed and using the most specific assay is essential
- Multiple IAbs confirmed in 90%; single high-affinity in 77%
- Single autoantibody positive children do progress to T1D and cannot be ignored
- Multiplex assays can overcome barriers to screening (specificity, sensitivity, cost, throughput)

Future Directions

- **Further expansion nationally, including targeted efforts within hospital and provider networks**
- **Screening of adults and children to identify all who are at risk**
- **Develop and test sustainability plan utilizing electronic medical record systems and telehealth options to enhance reach**
- **Work towards adoption of universal screening at the state government, payor, and healthcare provider levels**

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**Our ASK
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Partners



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Ask the Experts