Creation of the CMV Transmission and Immune Tracking (TransmIT) Study: Collaboration and Community Engagement

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CMV Public Health and Policy Conference

Salt Lake City, UT

October 2023

UMass Chan MEDICAL SCHOOL
UMass Memorial Health UMASS MEMORIAL MEDICAL CENTER
Children's Medical Center UMass Memorial Health UMASS MEMORIAL MEDICAL CENTER

Disclosures

Grant funding from Moderna Therapeutics

Logan Michael Colleran

cCMV Advocacy

MA cCMV Coalition

EDUCATE. PREVENT. SCREEN. CARE.

Massachusetts cCMV Coalition

A group of parents, educators, and clinicians dedicated to lessening the burden of CMV in our state.

Our Mission

- ***Educate*** the general public, healthcare providers, and other stakeholders about cCMV.
- ***Prevent*** cCMV through the promotion of specific behavorial practices among pregnant women.
- ***Screen*** all newborns for cCMV to improve the rate of diagnosis, especially children who are asymptomatic at birth.
- ***Care*** for children born with cCMV by sharing resources with parents about treatment, early intervention services, long-term monitoring, and counseling.

https://cmvmass.org **www.facebook.com/cmvmass**

cCMV Advocacy

SENATE DOCKET, NO. 1810 FILED ON: 2/18/2021

SENATE . . . . . No.

The Commonwealth of Massachusetts

PRESENTED BY:

Joan B. Lovely

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled:

The undersigned legislators and/or citizens respectfully petition for the adoption of the accompanying bill:

An Act relative to newborn screenings for congenital cytomegalovirus.

PETITION OF:

NAME:	DISTRICT/ADDRESS:
Joan B. Lovely	*Second Essex*

Collaboration: Academia and Industry

- UMass Chan Medical School and Moderna Therapeutics collaboration January 2021

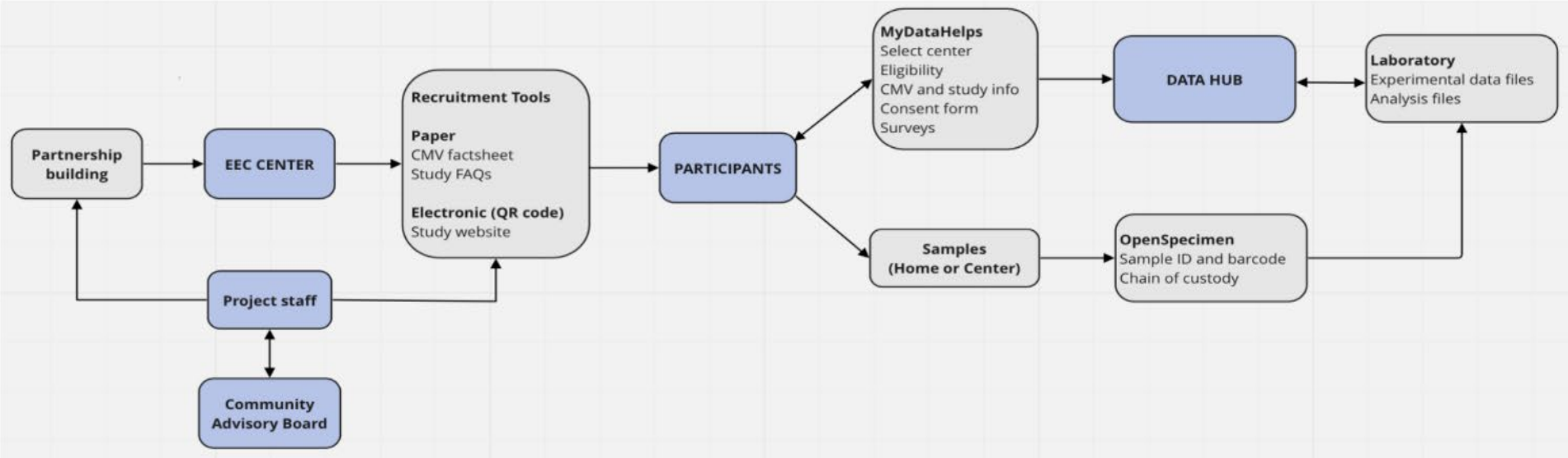
- Study objectives
  - Promote CMV awareness and education
  - Create a network of childcare centers as research partners
  - Study CMV transmission dynamics and immune correlates of decreased viral shedding in young children attending large group childcare

Designing the Study

Joint iterative process between the UMass Chan and Moderna teams

	Objectives	Eligibility	Sample	Data
Stage I 2-3 yrs	Protocols and infrastructure	Children ≤ 36 mos	Single saliva	Parents survey
	Network of childcare centers			CMV PCR and seq
	Community Advisory Board			
	Saliva CMV shedding prevalence			
Stage II 3-4 yrs	Risk factors	Children ≤ 36 mos	Longitudinal saliva, urine, blood	Parents survey
	CMV shedding incidence	Household members		CMV PCR and seq
	Transmission patterns			Population genetics
	Correlates of reduced shedding			Biomarkers B and T cells

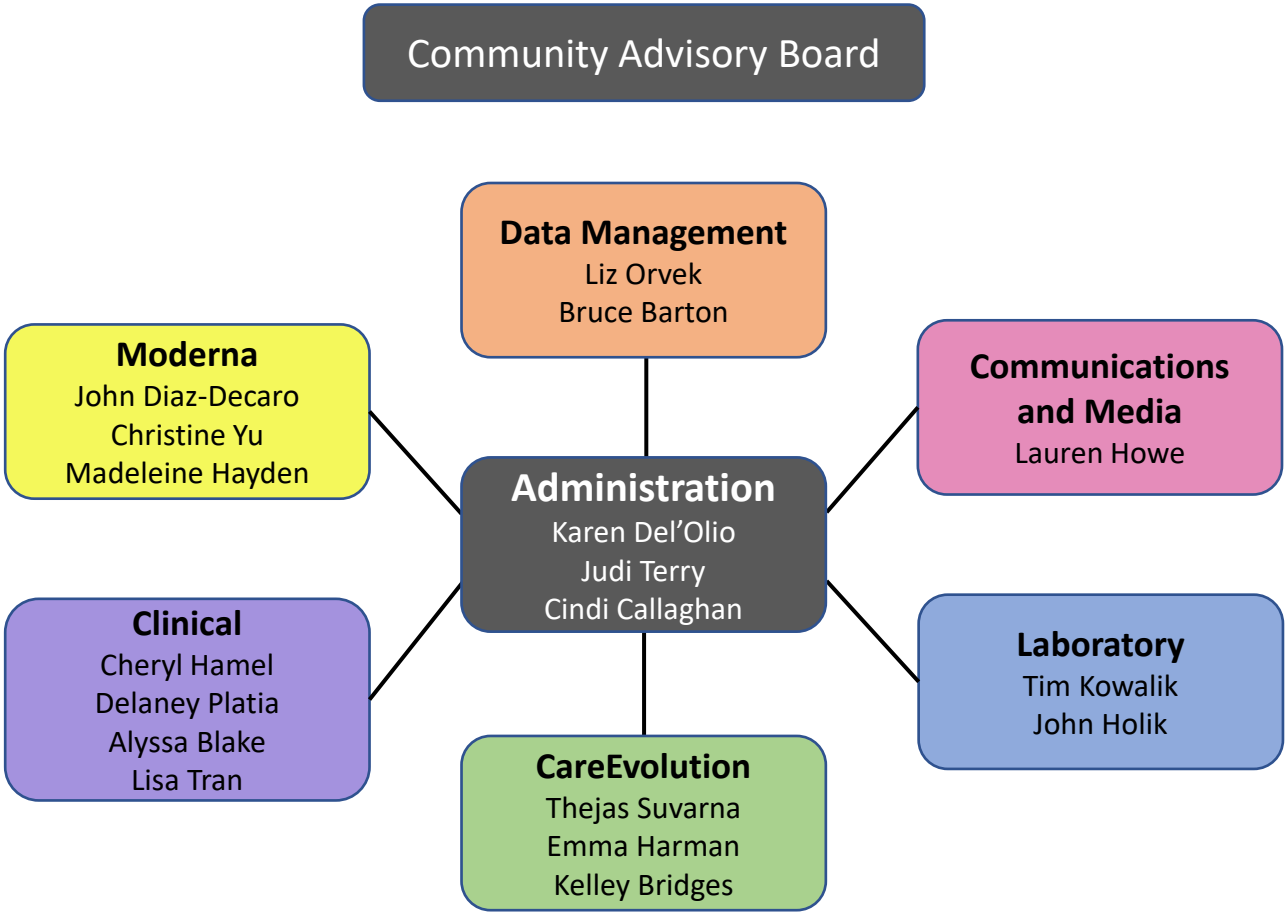
Designing the Study



Building the Team

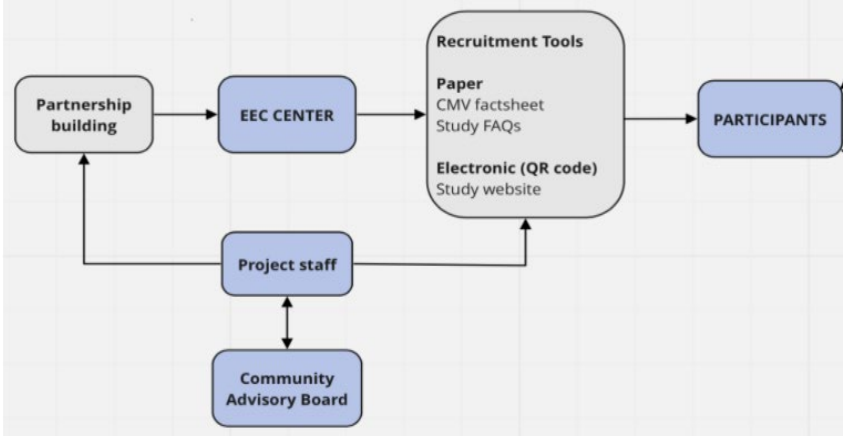
- Functional roles for individuals and teams based on objectives
- Guiding principles and group culture
- Internal communication style and platforms
- Staff training and professional development
  - CMV education
  - Collaborative Institutional Training Initiative (CITI)
  - Community Engagement and Research course (Harvard Catalyst)
  - Strengthening Translational Research in Diverse Enrollment (STRIDE) Program (UMass Chan)

Building the Team



Community Engagement
Network of Early Education and Care Centers

- Core values: diversity, equity, and inclusion
  - Investigated racial/ethnic and socioeconomic data for Worcester and Cambridge areas
- Sought guidance
  - Community engagement consultant with experience recruiting educational centers
  - Local partners, EEC professionals, state and regional agencies, healthcare professionals, parents of children with cCMV, and others connected to community health
- Networking to invite centers
- Onboarding centers
  - Directors meeting
  - Operations meeting
    - Customized operations plan
    - Collaborative agreement
  - CMV education for center staff and families



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UMass Chan class of 2025

Community Engagement
Community Advisory Board

Purpose

- Guide study team on the best way to develop and sustain relationships with EEC centers, invite centers to join, and implement the study
- Represent the perspective of communities potentially impacted by the CMV TransmIT Study

Phases of development

1. **Exploratory**
    - Environmental scan to better understand
        - Role of community advisory boards
        - Current state of the childcare field in MA
    - Interviewed 6 people
        - Online survey in REDCap and a 30-minute standardized interview
        - Discussed childcare workplace challenges, concerns of centers, and Board member recruitment
        - Recommended board representation from parents, centers, pediatric or childcare-related research, regional or state government working with centers, non-profit organizations, professional care providers and clinicians, and others

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UMass Chan class of 2025

Community Engagement
Community Advisory Board

2. Invitational

- Six members: a professor, industrial hygienist, two community organization directors, teacher, and parent
- Goal of 9 members

3. Organizational

- Convened in December 2022 with 5 members
- Developed charter and bylaws
  - 70/30 consensus for most decisions
  - Executive decisions made by the PI for IRB-related topics
  - Unanimous approval for Mission Statement and Charter
- Board provided guidance on recruitment, retention, and participant-facing materials
- Board piloted CMV education materials and knowledge gap surveys developed for childcare center staff

Developing the Digital Study Platform

Care Evolution™

- MyDataHelps (MDH) platform
- Web-based for Stage I and app for Stage II
- Backend management by research nurses
    - Dashboard of participants
    - Chain of custody for samples

Content

- CMV education
- Study information
- Consent form
- Surveys

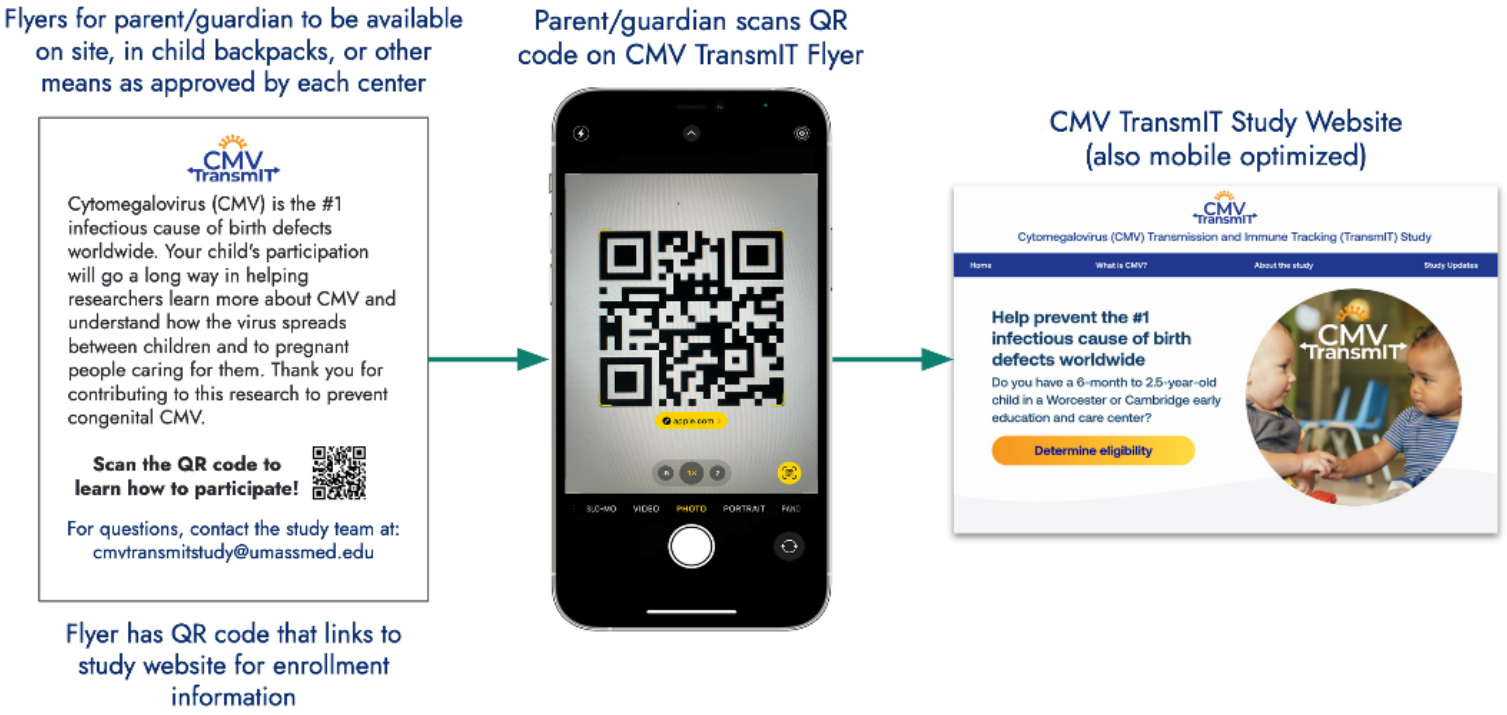
Capabilities

- Stepwise instructions
- Milestone landmarks
- Email/SMS notifications

https://careevolution.com

Developing the Digital Study Platform

- Low-friction enrollment through a website
  - No app to download
- Validation
  - Address through the platform
  - Identity through in-person sample collection



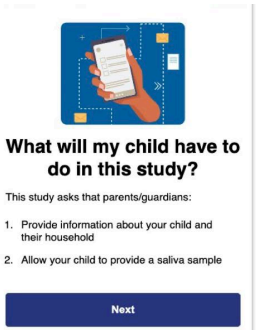
Developing the Digital Study Platform

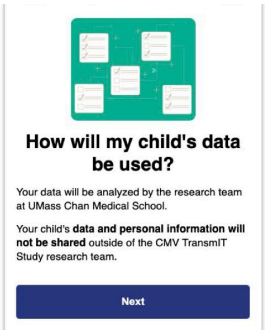
Care Evolution™

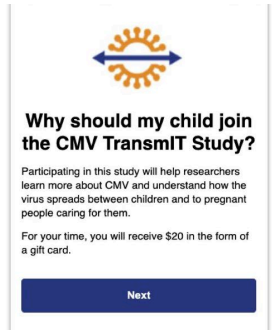
Initiating the enrollment process

LAR clicks call-to-action button to proceed to the eligibility survey

Informational onboarding

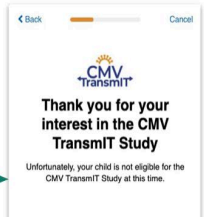


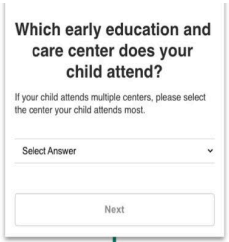




Eligibility assessment

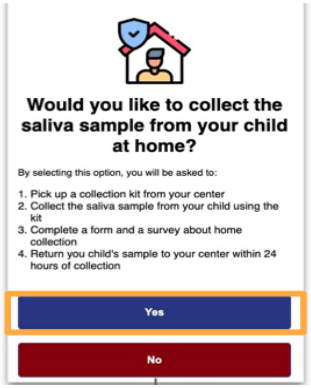
If eligibility criteria are not met



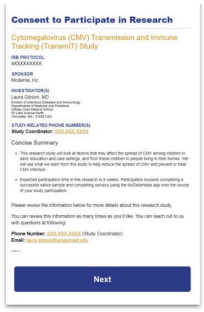


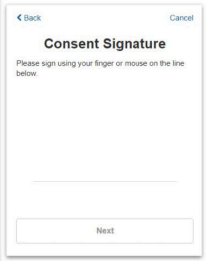
If "I don't see my center listed above"

Home sample collection pilot study

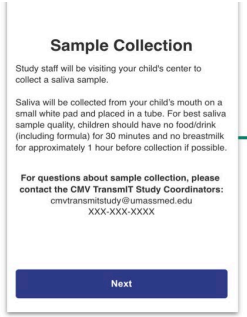


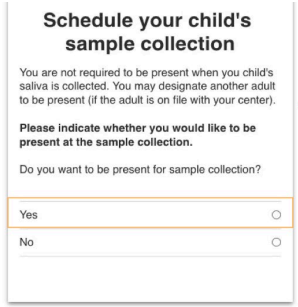
Consent





Schedule sample collection





Study Website

NOW LIVE!

https://cmvtransmitstudy.org

Study Website

Home page

CMV TransmIT

Cytomegalovirus (CMV) Transmission and Immune Tracking (TransmIT) Study

Home | What is CMV? | About the Study | Information for Centers | Updates

Help reduce transmission of the #1 infectious cause of birth defects worldwide

Do you have a child age 0 months to 36 months in an early education and care center in the Worcester or Cambridge areas of Massachusetts?

Determine eligibility →

What is this study about?

Researchers want to study how cytomegalovirus (CMV) spreads among young children in early education and care centers. Results of the study may help decrease CMV spread from these children to pregnant people caring for them.

Learn more →

What is cytomegalovirus?

Cytomegalovirus (CMV) is the most common prenatal infection. CMV can cause a range of major health problems in newborns. Pregnant people who are exposed to large groups of young children like childcare or preschools are at high risk for CMV infection and need to take precautions.

Learn more →

How do I reduce my risk of contracting CMV?

If you are pregnant, you can help protect your unborn baby from cCMV by avoiding contact with saliva and urine from babies and young children.

- Avoid kissing a child on the lips or cheek. Instead, kiss the top of their head, blow a kiss, or give them a hug.
- Do not share food, utensils, drinks, straws, pacifiers, or toothbrushes with a child.
- Wash your hands after changing diapers, wiping a child's face, feeding a child, or handling toys.
- Disinfect toys, countertops, and any other surfaces that might come in contact with a child's urine or saliva.

CMV by the numbers

- **90%** of women do not know about CMV or how it can affect babies before birth.
- **1/200** babies is born with cCMV infection.
- **30,000** babies are born with cCMV every year in the U.S.
- **10-15%** of babies with cCMV have health problems at birth.
- **15%** of babies with cCMV appear normal at birth and develop health problems later.
- **1/5** babies with cCMV have permanent disabilities such as hearing loss, cerebral palsy, or delays in development.
- **ONE** child is permanently disabled by cCMV every hour.
- **400** babies die of cCMV every year.

How can I help?

Join the study by following the steps below:

Step 1
Take the online eligibility assessment.

Determine eligibility

Step 2
Complete the online consent and surveys.

Step 3
Allow your child to provide a saliva sample.

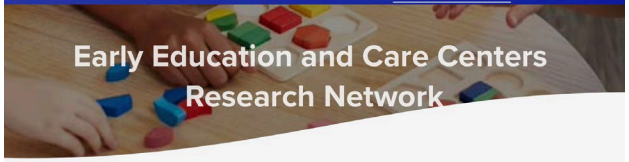
https://cmvtransmitstudy.org

Study Website

Childcare Centers

Cytomegalovirus (CMV) Transmission and Immune Tracking (TransmIT) Study

Home | What is CMV? | About the Study | Information for Centers | Updates



What is the Early Education and Care (EEC) Center Research Network?

The EEC Research Network is a consortium of centers that have joined UMass Chan Medical School as partner sites in the CMV TransmIT Study. Centers are based in the Worcester and Cambridge areas of Massachusetts.

Learn more about participating in the EEC Research Network →

Why join the EEC Research Network

By joining the network, centers and their familes can help advance CMV research toward:

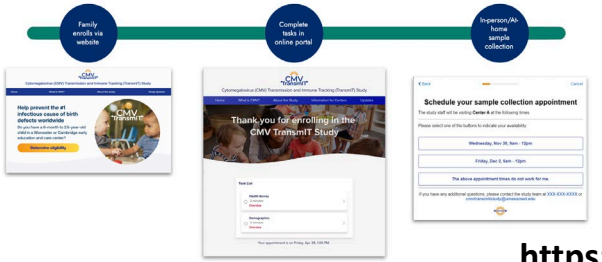
- reducing the number of babies born with congenital CMV, and

What is the role of my center in the study?

As part of the EEC Research Network, your center will allow study staff to interact with children and their families to provide CMV education, enroll participants, and collect samples. We want to take research out of the lab and bring it to where people live and work!

The CMV TransmIT Study Team is **committed to building partnerships with centers** to support mutually beneficial and optimal workflows.

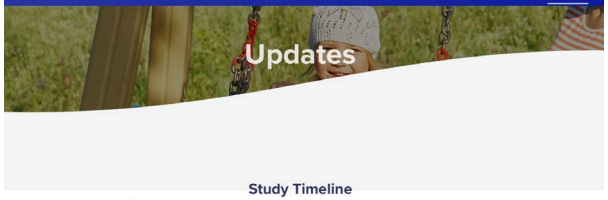
Family participation in the CMV TransmIT Study is easy!



Updates

Cytomegalovirus (CMV) Transmission and Immune Tracking (TransmIT) Study

Home | What is CMV? | About the Study | Information for Centers | Updates



Study Timeline

April 2023	Institutional Review Board approves study application
March 2023	YWCA Central Massachusetts becomes the first Early Education and Care (EEC) center to join the research network
January 2023	Application submitted to the UMass Chan Institutional Review Board
December 2022	Community Advisory Board meets for the first time
July 2022	CareEvolution joins the project
February 2022	First Project Plan approved by UMass Chan and Moderna
March 2021	Communications planning begins
January 2021	UMass Chan Medical School and Moderna Therapeutics begin to talk about this study

Blog


CMV in Newborns


Newborn Screening


Taking A Chance

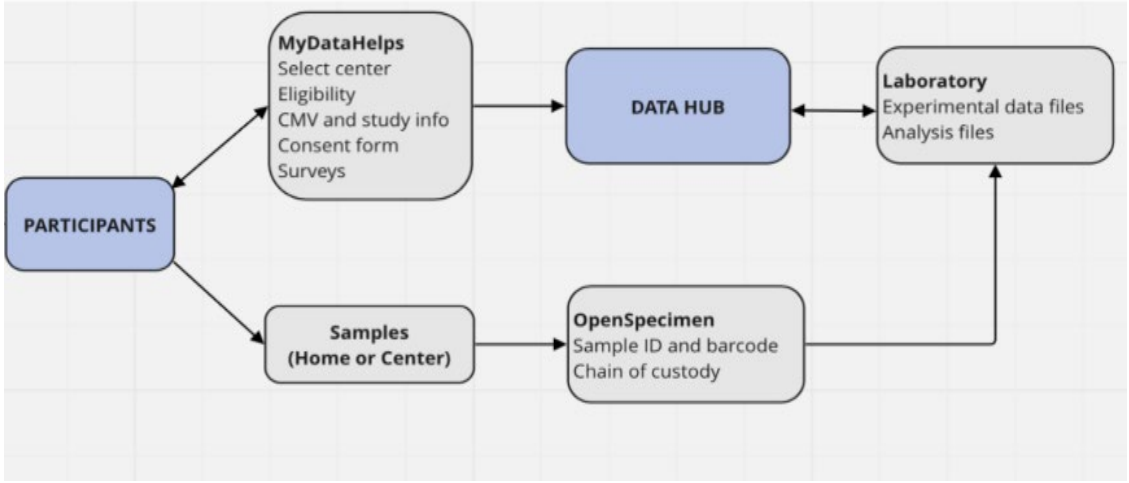
Scientific Articles

Cytomegalovirus and Child Day Care: Evidence for an Increased Infection Rate Among Day-Care Workers	*Cytomegalovirus and child day care: risk factors for maternal infection*	*Prevention of child-to-mother transmission of cytomegalovirus by changing behaviors: a randomized controlled trial*
S.P. Adler et al — November 1989	S.P. Adler, MD — August 1991	S.P. Adler et al — March 1996
Congenital Cytomegalovirus Infection: Update on Treatment	*Birth Prevalence and Natural History of Congenital Cytomegalovirus Infection in a Highly Seroimmune Population*	*Valganciclovir for Symptomatic Congenital Cytomegalovirus Disease*
B.C. Marshall & S.P. Adler — February 2009	M.M. Mussi-Pinhata et al — August 2009	D.W. Kimberlin et al — March 2015

https://cmvtransmitstudy.org

Data Infrastructure

- Data management and analysis needs assessment
  - Data sources: MDH, REDCap, Qiaquity dPCR, Illumina sequencing
- Data processing, cleanup, and storage
- Statistical and bioinformatics analysis plans
  - Identify analysis tools (e.g. Qiagen CLC Genomics Workbench for viral sequencing data)



Institutional Review Board Approval

- Team writing approach for all materials with regular IRB consultation
- The Informed Consent Form and other participant-facing materials were prepared using a health literacy lens
- Ethics of not sharing CMV PCR results with parents
- Initial submission and ongoing modifications

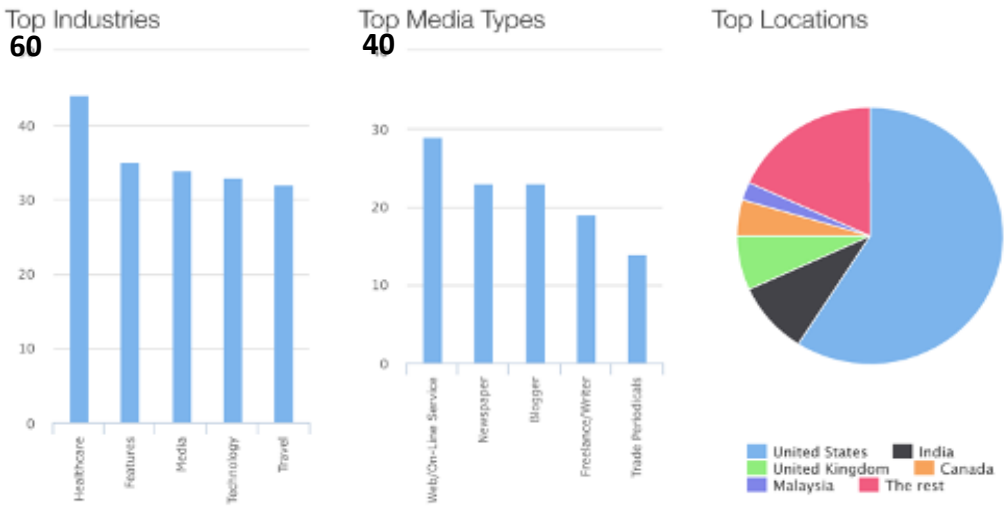
Communications and Media

- Communications consultant hired as a public-facing representative
    - Important for community-based clinical research
- Branding for the CMV TransmIT Study
    - Easy recognition
- Earned, social, and owned media
    - Study established on Twitter and Instagram in June 2022

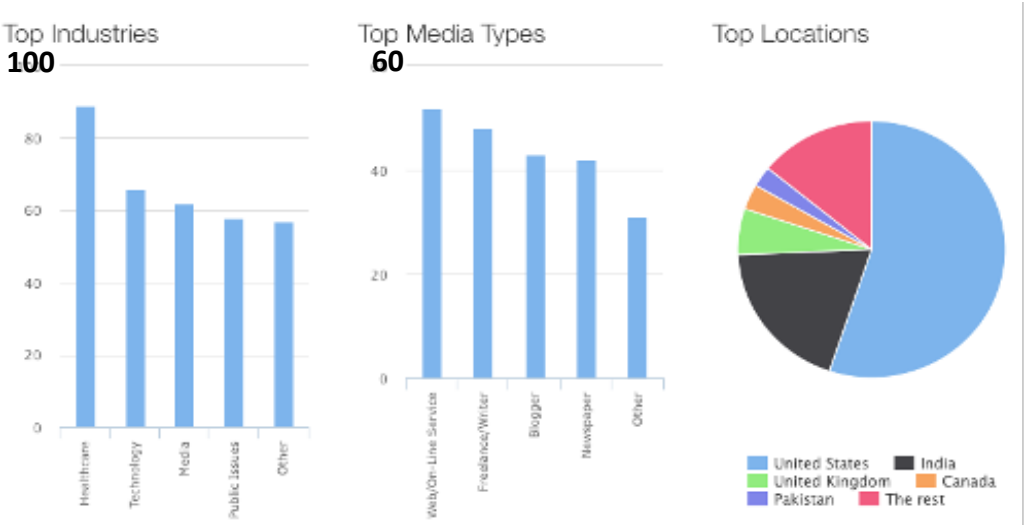
Lauren Howe
empHowered PR

Communications and Media

Study announcement press release March 2022



Study enrollment press release August 2023



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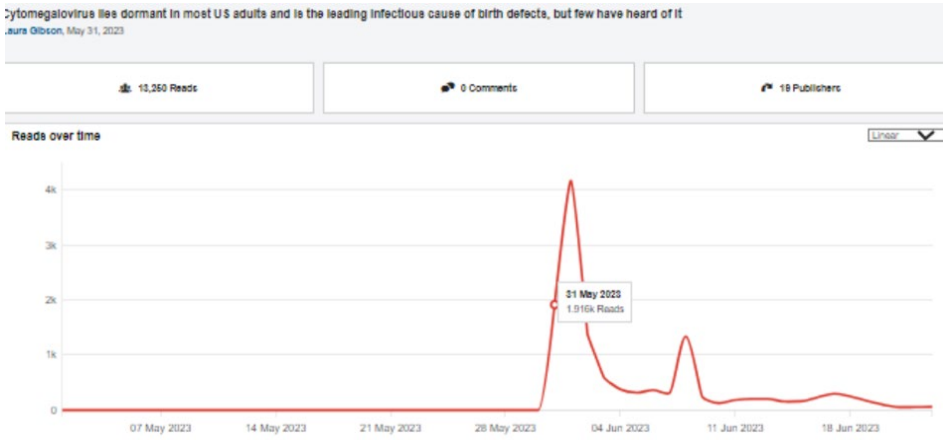
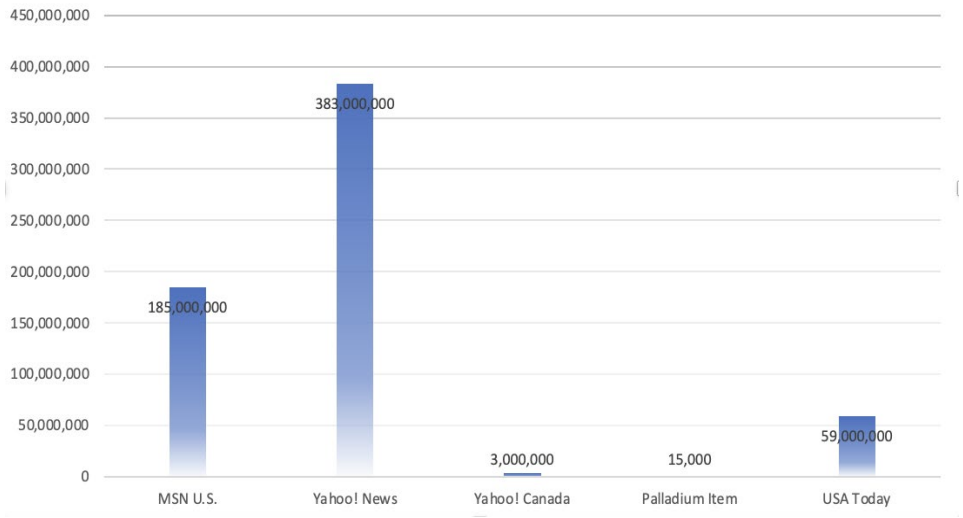
empHowered PR

Communications and Media

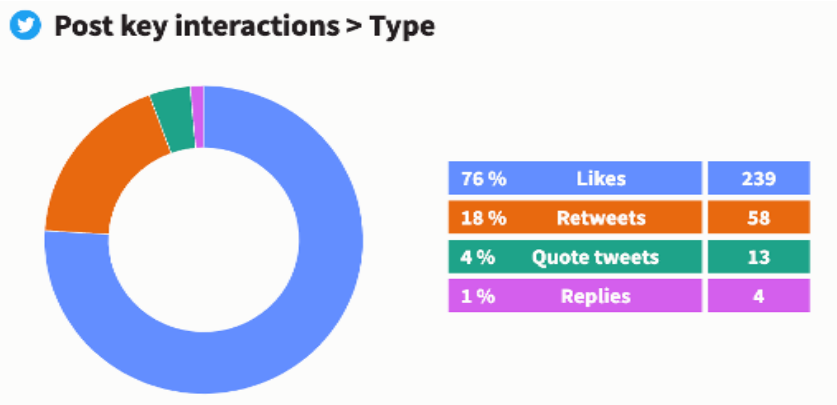
The Conversation
May 31, 2023



USA Today
October 2, 2023



Social media

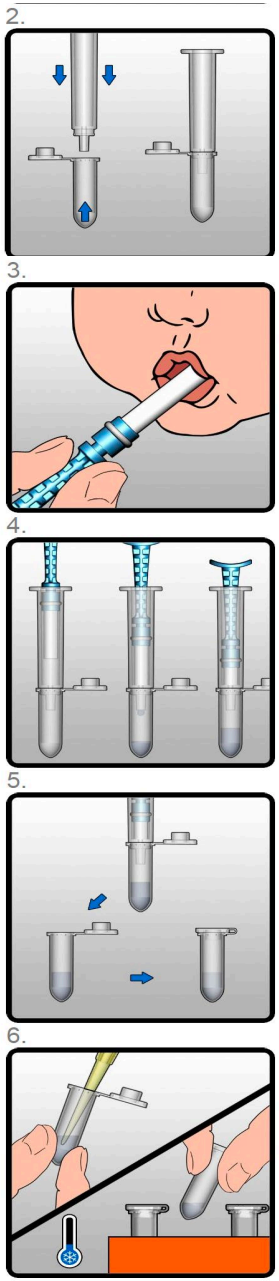


Laboratory Infrastructure

- Develop participant alphanumeric study ID format
- Develop an electronic repository system to track samples in storage and link to the central database
- Choose a saliva collection device *
  - safe for children up to 36 months of age and for children with oral/facial abnormalities
  - approved for use in children
  - minimally distressing for participants
  - ability of parents with varied education and health literacy to understand the instructions
  - ease of use by study staff at centers or parents collecting the sample at home
  - absorbent pad with high saliva volume capacity
  - minimal filtering of cells or proteins
  - acceptable ratio of sample to viral transport medium to sustain viable virus
  - ease of use by study staff at centers or parents collecting the sample at home
  - reasonable cost
  - feasibility of packaging in a sampling kit
- Optimize dPCR assay for all sample types

* Guidance from the UMassMemorial Health Kids Comfort Promise team

Laboratory Infrastructure



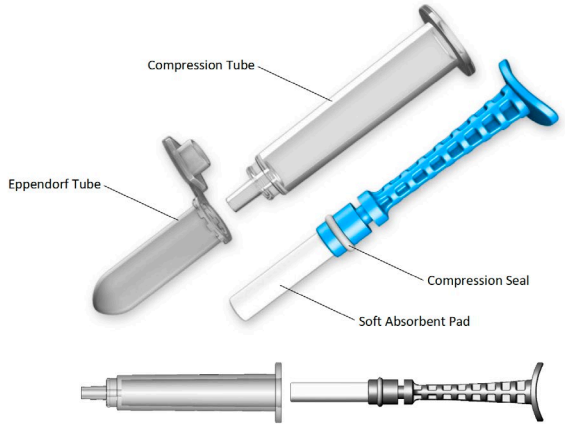
Sample collection and storage

- Reviewed and tested potential devices
- MicroSAL™ for Children device by Oasis Diagnostics® Corporation met the 10 criteria most closely
  - Research use only
- OpenSpecimen platform for sample repository database
  - Document movement of samples from collection to storage

Micro•SAL™

Infant Saliva Collection

Catalog Number MRSAL-402



https://4saliva.com/micro-sal-2/

Laboratory Infrastructure

Stage 1

Child

Data fields
Participant ID: CMV1-64828-84923
Sample type: S, U, B
Time point: V#

Sample ID
64828-84923.(S,U,B).V#

Stage 2

Child

Data fields
Participant ID: CMV2-12423-25442
Stage 1 ID: CMV1-64828-84923
Household ID: GTHSW
Participant type: C
Sample type: S, U, B
Time point: V#

Sample ID
12423-25442.GTHSW.C.(S,U,B).V#

Primary Caregiver

Data fields
Participant ID: CMV2-76231-94648
Household ID: GTHSW
Participant type: PC
Household member: 1
Sample type: S, U, B
Time point: V#

Sample ID
76231-94648.GTHSW. PC.(S,U,B).V#

Household Member

Data fields
Participant ID: CMV2-64746-29457
Household ID: GTHSW
Participant type: HM
Household member: $\geq$ 2
Sample type: S, U, B
Time point: V#

Sample ID
76231-94648.GTHSW.HM1.(S,U,B).V#

Creation of Key Documents

Audience	Documents
Study Team	Guiding Principles
	Standard Operating Procedures
	Manual of Operations
	Study tools
	• Child assessment form
	• Coordinator forms
Childcare Centers	Collaborative agreement
	Operations Plan
	Survey
Participants	CMV Fact Sheet
	FAQs
	Demographic survey
	Home sample collection pilot
	• Saliva collection instructions
	• Child assessment form
	• Post-pilot feedback

- Participant-facing documents were developed to prioritize diversity, equity, and inclusion, minimize burden, and optimize data processing and quality.
- Resources from the NIH and Trevor Project were used for guidance

Progress to Date

Category	Milestone	Components	Status
Structure	Organizational structure	Teams	Hiring complete
	Communications	Press releases, blogs, social media	Ongoing
	Digital study vendor	Study platform	Live
		Website	URL and QR code accessible
	Data management	Flow, storage, security	Live
	Laboratory	Saliva collection device	MicroSal™ in use
		Sample repository system	Live
Study	IRB approval	Initial	Approved
		Modification 1	Approved
		Modification 2	Pending
	Network of EEC centers	Engagement	Worcester 8 of 10 Cambridge pending
		Agreements and operations	6 signed, 2 pending
		CMV education sessions	10 sessions, 58 attendees
	Community Advisory Board	Members	6 of 9
		Meetings and operations	4 meetings Mission statement, charter, bylaws
	Enrollment	25 participants since 8/2/23 (5 home collection pilot)	20 samples, 19 surveys

Acknowledgements

UMass Chan Medical School

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Liz Orvek
Bruce Barton
Kelsey Wood
Susan Drucker

Annie Geiger
Lori Sahakian
Becki Sandvos

Department of Medicine
Karen Griffin
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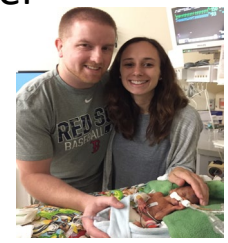
Community Advisory Board members

moderna

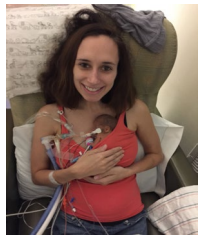
John Diaz-Decaro
Madeleine Hayden
Christine Yu
Sandeep Basnet
Lori Panther
Drew Natenshon
Stephanie Kalb

Care Evolution™

Thejas Suvarna
Emma Harman
Kelley Bridges
Summer Schrader





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