



# **Water, Sanitation, and Hygiene Mobile Health as an Innovative Tool to Facilitate Behavior Change in Bangladesh: CHoBI7 Mobile Health Program**

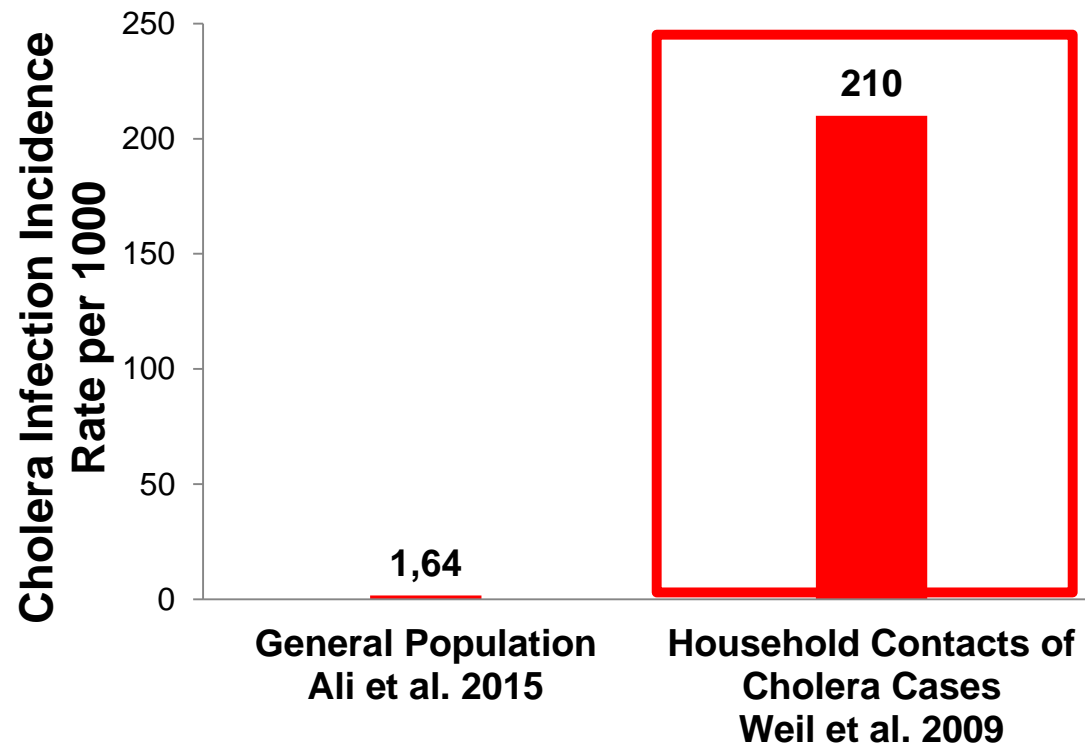
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**Department of International Health**



# Study Rationale

Household members of cholera patients in Bangladesh are at a 100 times higher risk of developing a cholera infection than the general population



# Cholera Hospital-Based Intervention for 7 days CHoBI7 Intervention Program





# Enabling Technology and Demonstrations



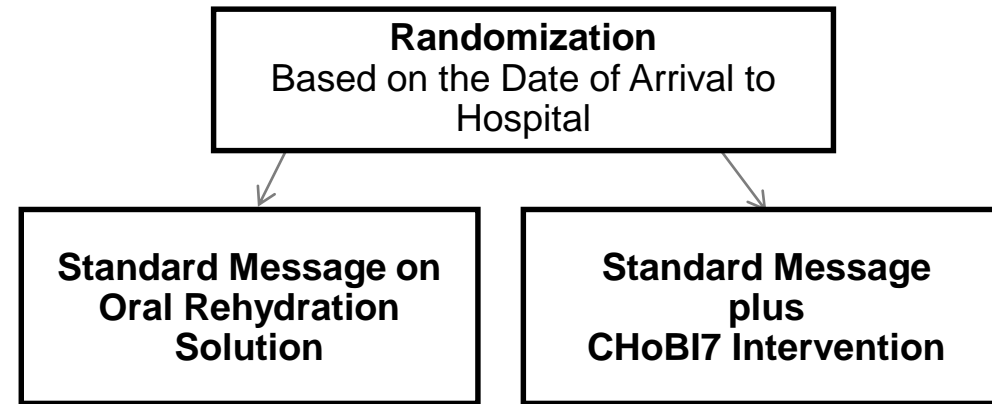
# Research Site

## International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) Dhaka Hospital



# Randomized Controlled Trial of CHoBI7

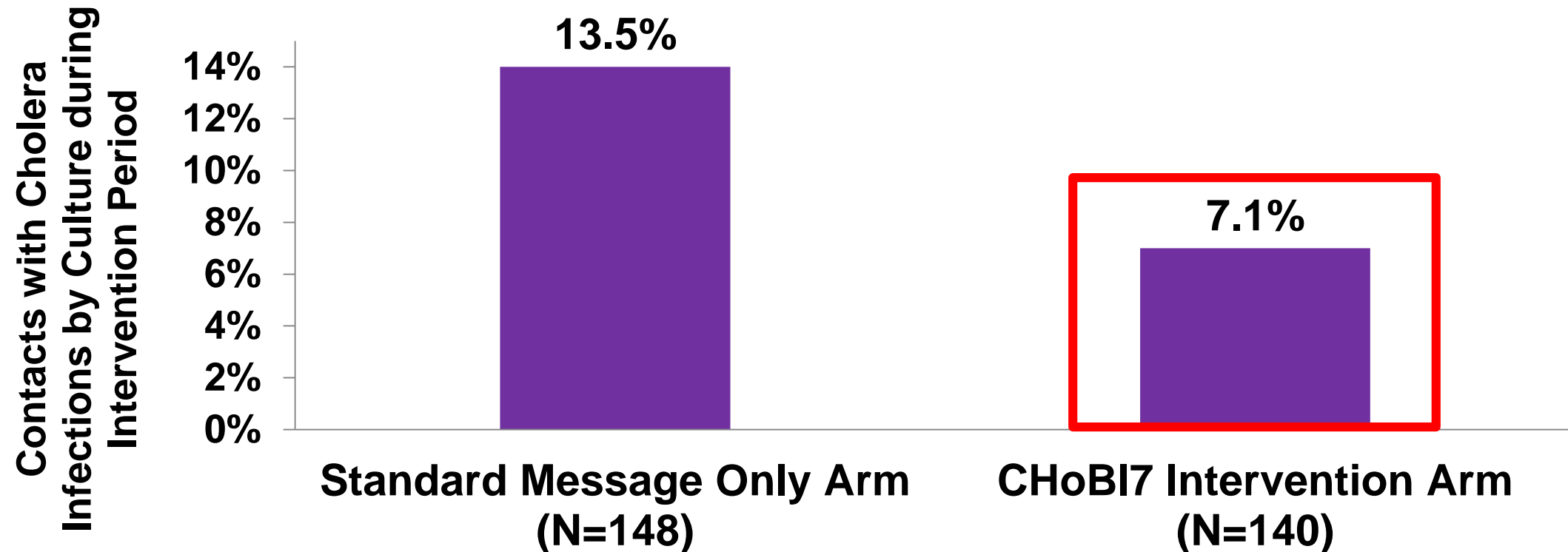
## Cluster Randomized Controlled Trial 2013-2014 Dhaka icddr,b Hospital



# CHoBI7 Intervention Program

## Cholera Hospital-Based Intervention for 7 days

**47% Reduction in Overall Cholera Infections among Household Members in CHoBI7 Intervention Arm**





# Current Work

## Investigating Scalable Approaches for CHoBI7



**USAID**  
FROM THE AMERICAN PEOPLE



# Sender of CHoBI7 mHealth Messages: Dr. Chobi



# Example Voice Message: Dr. Chobi



**Assalamulalaikum. Dr. Chobi from the Cholera Hospital.  
How are you?**

**Have you been using the soapy water we gave you in the  
hospital?**

**Making more soapy water is easy add six capful of  
detergent to a plastic water bottle and then add water.**

**To protect your family from cholera, make sure your  
whole family washes their hands with soapy water after  
defecation or urination and before preparing, eating, or  
feeding children. Please tell my words to all family  
members.**

**I'll talk to you again. Take care!  
Keep your family healthy and happy!**

# Example Voice Messages: Aklima Peer Role Model



**Dr. Chobi: I am with my new patient, Aklima. Aklima, Can you tell me how to treat water using chlorine tablets?**

**Aklima: Yes! Add the chlorine tablet and wait 30 minutes to drink.**

**Dr. Chobi: Thank you Aklima! That's absolutely right!**

**You and Aklima are starting to become experts. Do not forget to share the text and voice messages with others in your family members!**

# Example Voice Messages: Aklima's Husband Peer Role Model



**Dr. Chobi:** How are you brother? How is Aklima and your children?

**Aklima's Husband:** Yes, good! My children had severe diarrhea. Now, they remain healthy.

**Dr. Chobi:** Why do you think they remain healthy now?

**Aklima's Husband:** By drinking chlorinated water and washing hands with soapy water at key times as you instructed, our children are healthy now! You called and texted us and I have shared these messages with my family and followed all the instructions.



# CHoBI7 Mobile Health Program Delivery



**Voice and Text Messages  
12 Months**



# Health Facility CHoBI7 Program Delivery

## Pictorial Module Delivered by a Health Promoter



## Handwashing Station and Drinking Water Vessel

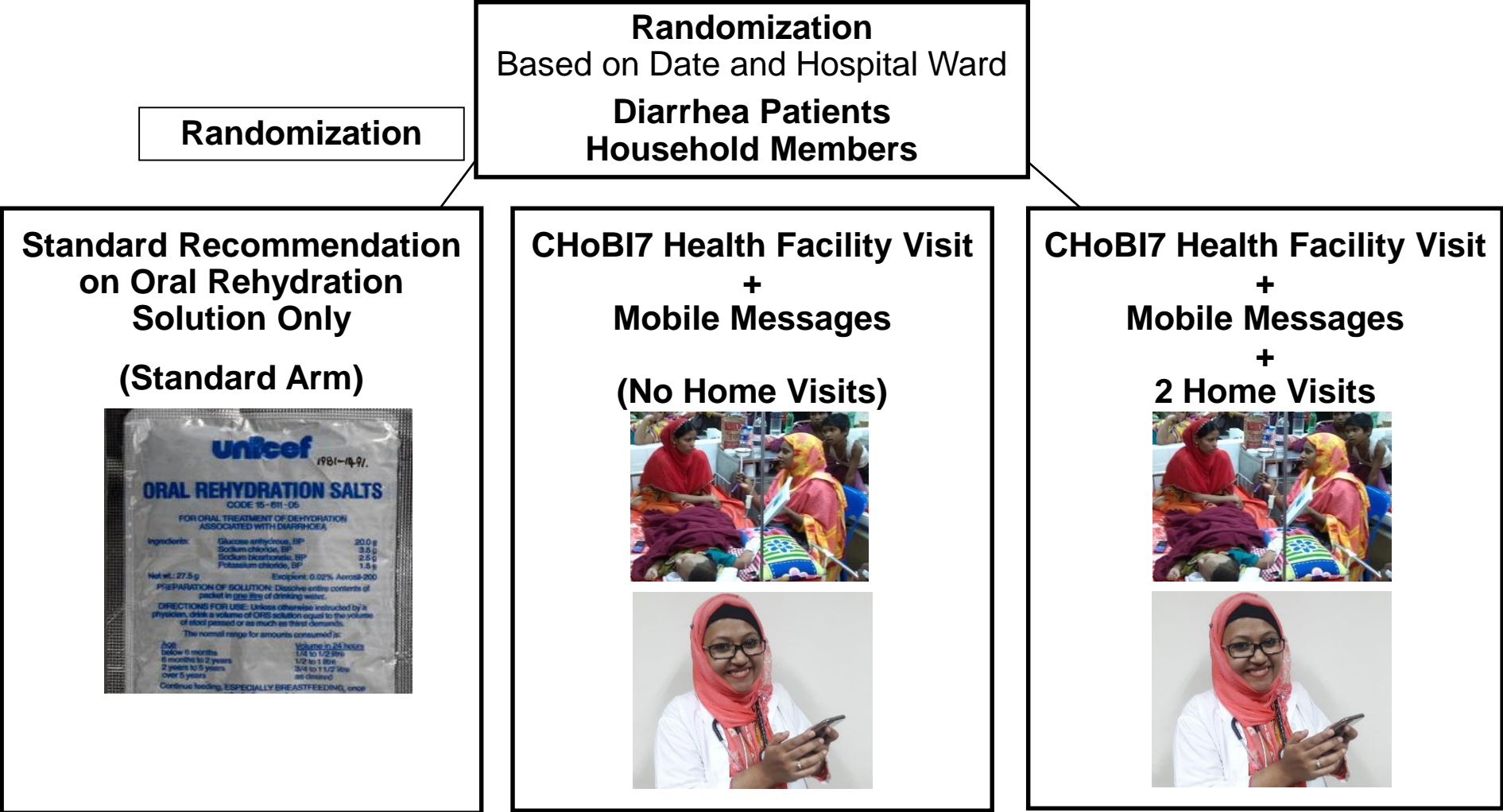


## Cue Cards of Promoted WASH Practices



# Study Design: Randomized Controlled Trial

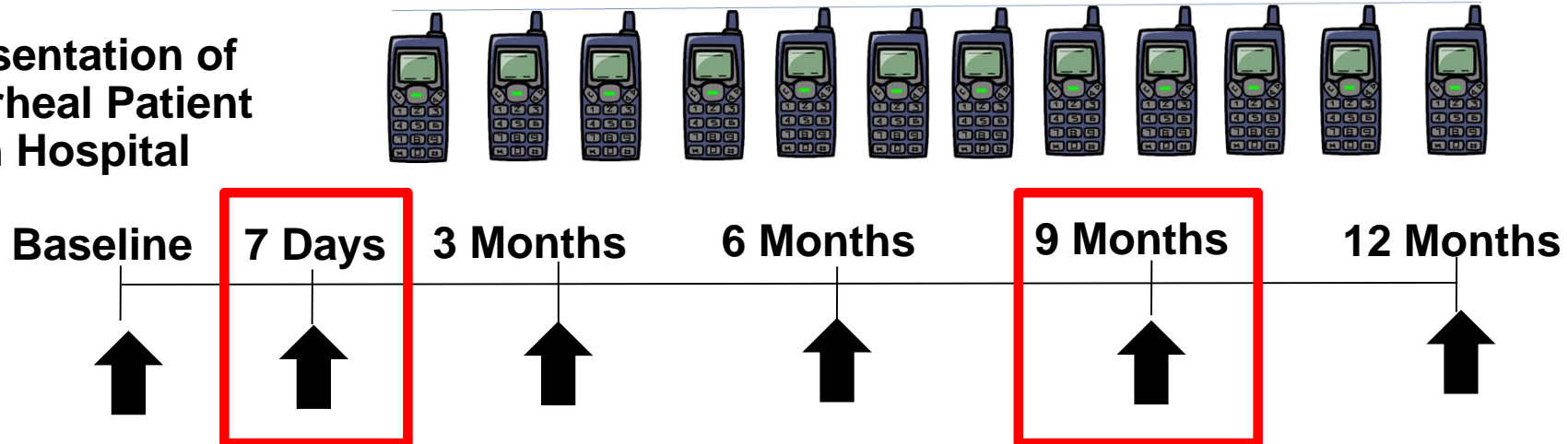
Study Site: Dhaka icddr,b and Mugda General Hospital



# Study Design



**Presentation of Diarrheal Patient in Hospital**

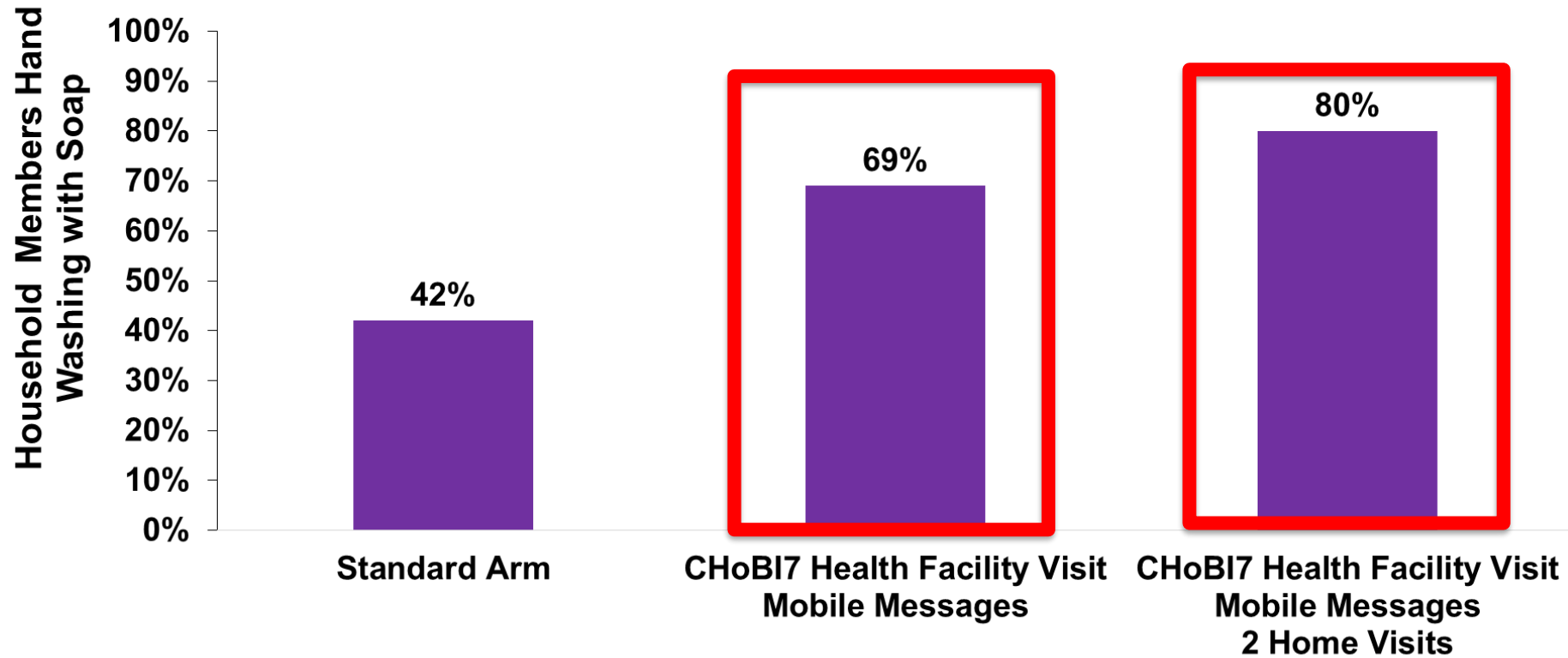


- 5 Hour Structured Observation of Handwashing Practices
- E.coli Counts of Household Stored Drinking Water



# Findings: Five Hour Structured Observation

## Hand Washing with Soap at Stool and Food Related Events 7 Day Follow-up (N=331)

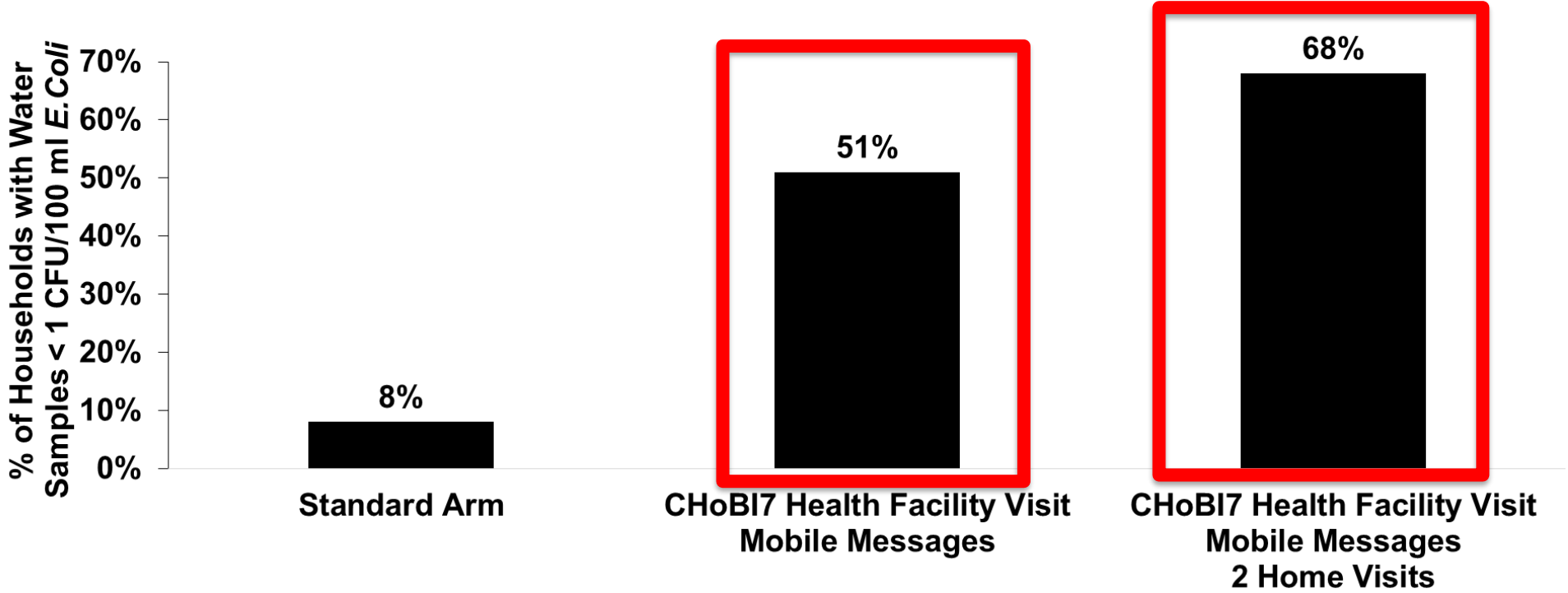


OR (95% CI):	Reference	3.32 (1.66, 6.67)	5.67 (2.74, 11.74)
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OR: Odds Ratio

# Findings: Stored Household Drinking Water Quality

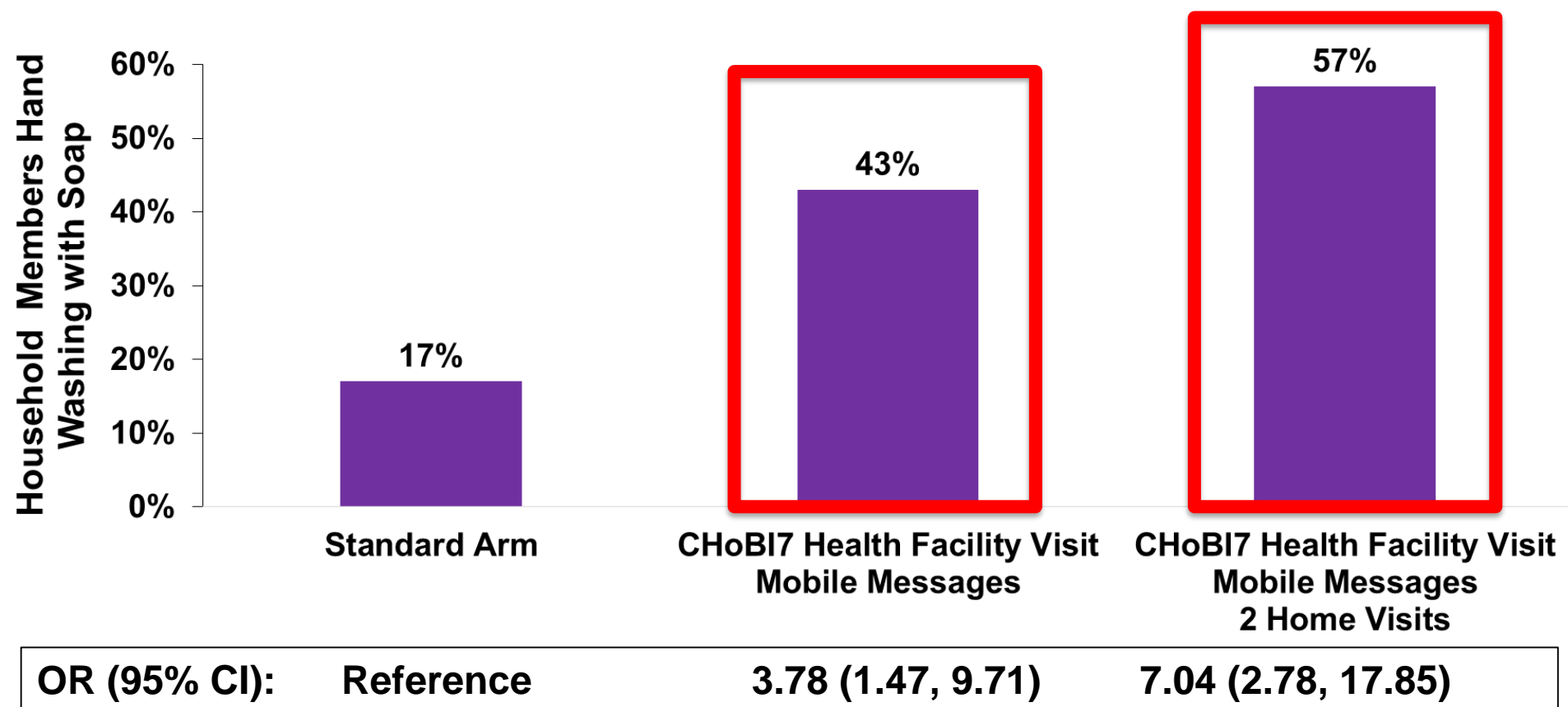
Water Samples Less than 1 CFU/100 ml of *E.coli*  
7 Day Follow-up (N=487)



OR (95% CI):	Reference	11.13 (5.94, 20.86)	22.99 (12.11, 43.63)
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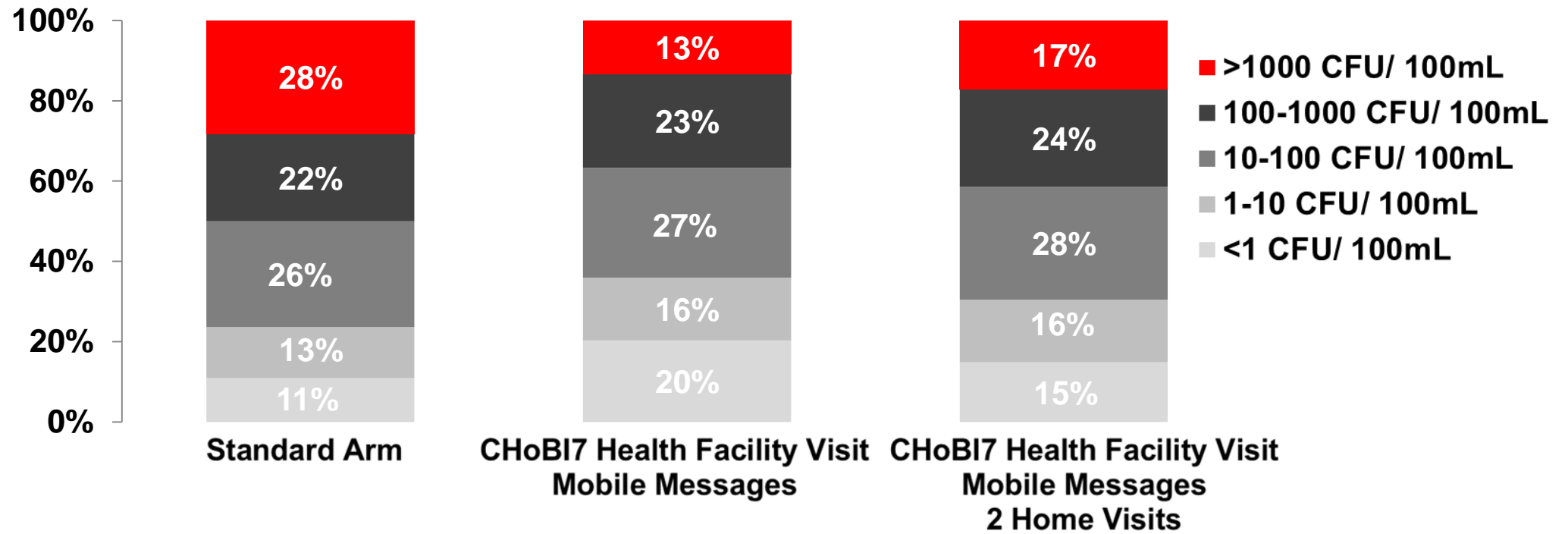
# Findings: Five Hour Structured Observation

## Hand Washing with Soap at Stool and Food Related Events 9 Month Follow-up (N=203)



# Findings: Stored Household Drinking Water Quality

WHO Very High Risk Category > 1000 CFU/100 mL of *E.coli*  
9 Month Follow-up (N=376)



<b>OR (95% CI): Reference</b>	<b>0.39 (0.20, 0.75)</b>	<b>0.53 (0.29, 0.98)</b>
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# Summary

- **CHoBI7 mobile health program resulted in significantly higher handwashing with soap and improved water quality which was sustained at our 9 month follow-up.**
- **Health facility delivery of the CHoBI7 intervention and the mobile health program alone with no home visits was sufficient to facilitate WASH behavior change.**



# Conclusion

- **These findings demonstrate that mobile health presents a promising approach to facilitate WASH behavior change during cholera outbreaks in this setting**



# Study Team



## Principal Investigators

- Dr. Christine Marie George
- Dr. Munirul Alam
- Dr. Shirajum Monira

## Ministry of Health and Family Welfare

- Dr. Sanya Tahmina
- Dr. Abul Hashem Khan

## Evaluation Team

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- Dr. Shwapon Biswas (Team Leader)
- Dr. Saif-Ur-Rahman (Team Leader)
- Dr. Tasdik Hasan (Team Leader)
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- Lubna Tani
- Tahera Taznen
- Ismat Minhaz Uddin
- Rafiqul Islam
- Al-Mamun
- Maynul Hasan
- Kalpona Akhter
- Khandokar Fazilatunnessa
- Sadia Afrin Ananya
- Akhi Sultana
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## Intervention Team

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- Shirin Akter
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## Johns Hopkins Study Investigators

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- Dr. Jamie Perin
- Dr. Alain Labrique
- Dr. Peter Winch
- Kelsey Keller
- Camille Morgan
- Khaled Hasan

## Data Management Team

- Md. Sazzadul Islam (Team Leader)

## Laboratory Team

- Fatema Johura (Team Leader)
- Dr. Marzia Sultana (Team Leader)
- Zillur Rahman (Team Leader)
- Mahamud-ur Rashid (Team Leader)

## Laboratory Team (Continue)

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- Toslim Mahmud
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## Johns Hopkins Students

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- Gayathri Natarajan
- Anne O'Connor
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- Lauren Oldja
- Alana Teman
- Vanessa Burrowes
- Sohel Rana
- Hasan Shihab

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- Johns Hopkins
- Center for Global Health (George PI)
- USAID WASHPaLS (George PI and Alam PI)



# Acknowledgements





# Questions

