

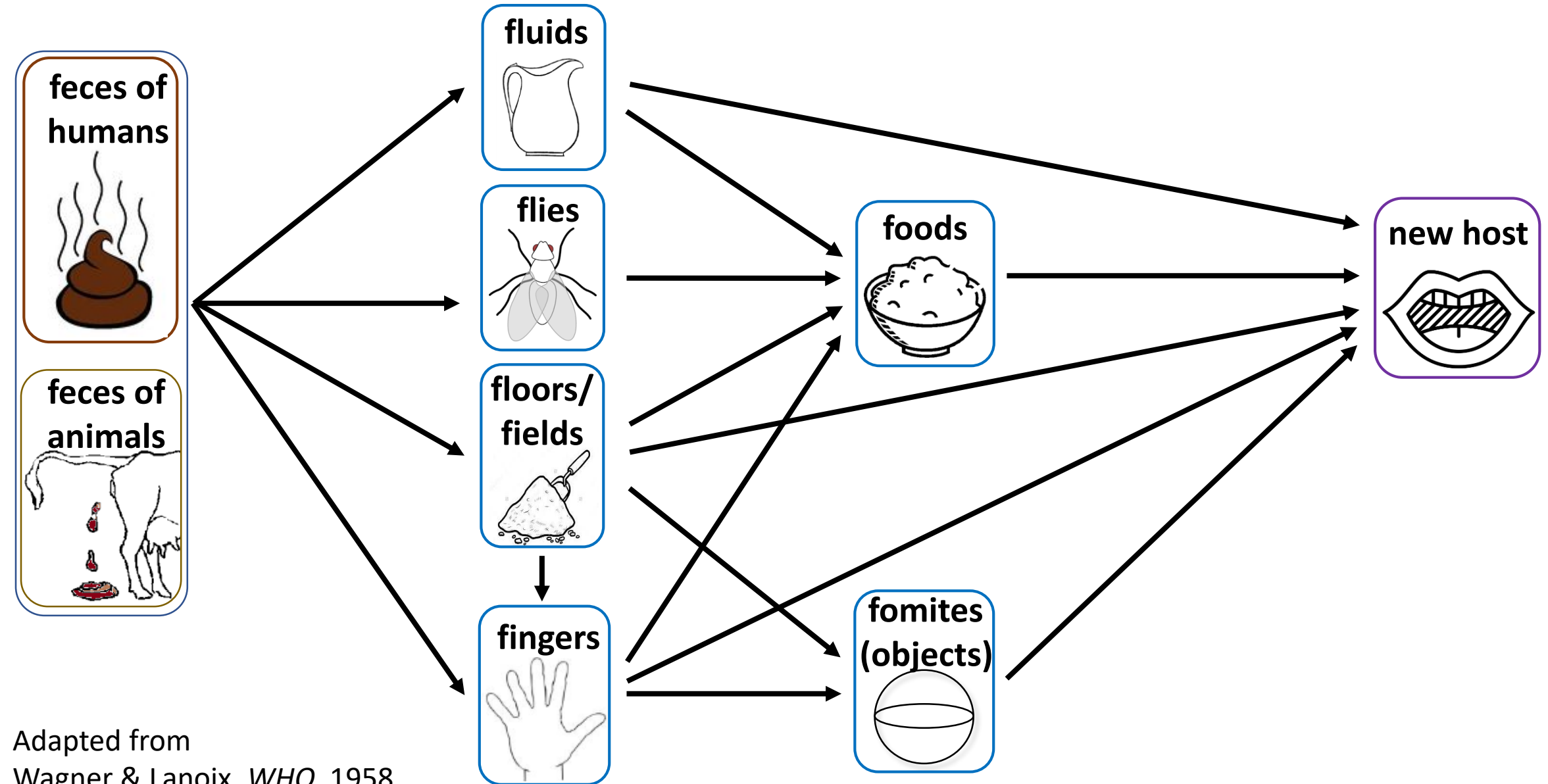
Addressing Food Hygiene, Animal Husbandry, and Hygienic Environments to Improve Child Health: On-going studies and Considerations for Practitioners



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Which fecal transmission pathway contributes most?



Adapted from
Wagner & Lanoix, *WHO*, 1958





Different animal (feces) have different risks

Animal	Disease	Potential consequences
Poultry	<i>Campylobacter</i> spp.	Growth faltering, diarrhea
Poultry	<i>Giardia</i>	Growth faltering, diarrhea
Ruminants (Cows/goats/sheep)	<i>Giardia</i>	Growth faltering, diarrhea
Sheep	Shiga toxin-producing <i>E. coli</i>	Diarrhea
Pigs	<i>Cryptosporidium</i>	Growth faltering, diarrhea

Zambrano, *Trans. R. Soc Trop. Med. Hyg.*, 2014

Rogawski, *Lancet Global Health*, 2018

Checkley, *Am. J. Epidemiology*, 1998

Korpe, *Clin. Inf. Dis.*, 2018

Elements of “Transformative WASH”: Baby WASH

1. Safe food preparation, feeding, and food storage practices
2. Separation of children from animals and animal feces
3. Environmental hygiene



Safe food preparation and feeding practices



What practitioners can do

Encourage households to

- Wash hands before and during food preparation
- Cover cooked food at all times
- Serve food with a spoon, not by hand
- Do not store food for >4 hours



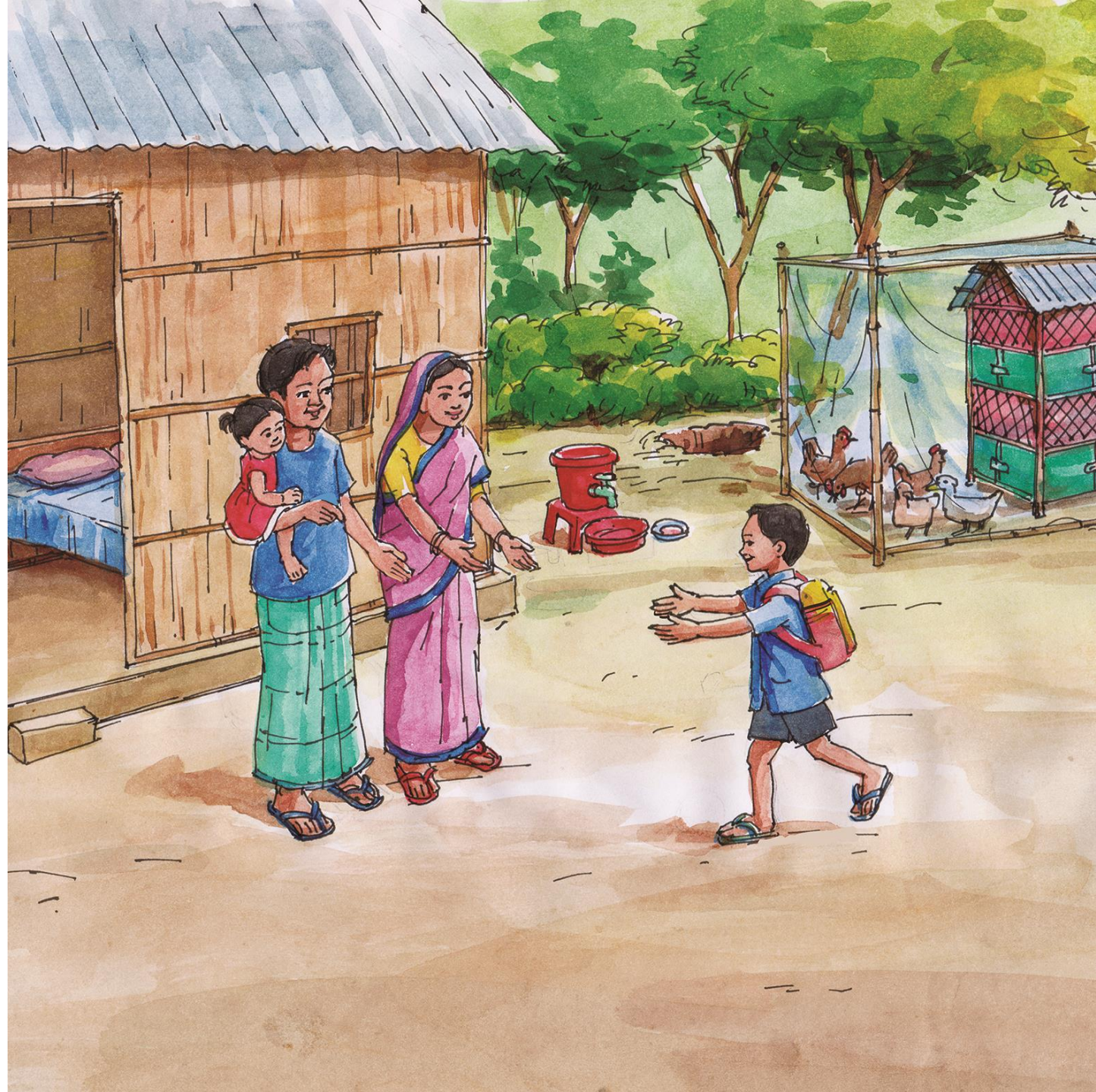
Separating Children from Poultry: It's Easy to Chicken Out

Research team: Tarique Huda, Rofi Uddin, Shifat Khan, Jesmin Sultana, Al-Almin Hossain, Salma Akter, Nadia Rimi, Ireen Shanta, Fosiul Nizame, Mahbub Rahman, Jen Ching, Liz Thomas, Peter Winch, Laura Kwong



Motivators

- Poultry health and productivity
- Child health (sickness and cognitive development)
- Reducing conflict with neighbors
- Comfort hosting guests



Concerns & constraints

..for keeping birds inside at night

- Fear of predators and theft
- Cost of shed
- Adequate space for shed
- Smell of housing poultry inside and embarrassment if there is no time to clean thoroughly clean the space every day

... for confining birds during the day

- Adequate high-protein food















Target behaviors




1. Confine all poultry out of the living space at night
2. Wash hands with soap after contact with poultry, poultry products, or poultry feces
3. Remove poultry feces as soon as you see them
4. Dispose of poultry feces in specific place
5. Contain all chickens during the day as much as possible



Neighborhood problem-solving to reduce children's exposure to poultry feces



বেড়াঃ যতটুকু সম্ভব দিনের বেলা সকল হাস-মুরগি আটিকে রাখুন
Corral: Contain all chickens during the day as much as possible

Image (ছবি)	Activity (কার্যক্রম)	Target date (নির্দিষ্ট তারিখ)	Date done (সম্পন্ন হওয়ার তারিখ)	Barriers (প্রতিরোধকতা সমূহ)	Solution (সমাধান)
	বেড়া তৈরির সম্পর্কিত আলোচনা 1. Discussed building a corral				
	বেড়া তৈরির সিদ্ধান্ত 2. Decided to build a corral				
	বেড়া তৈরির স্থান নির্বাচন 3. Selected site for corral				
	বেড়ার উপকরণ এবং খরচ নির্ধারণ 4. Determined materials and cost of corral				

What practitioners can do

Work together across sectors agriculture, livelihood, WASH, and nutrition to aggregate data / add questions to existing surveys on...

- Type, number and age of animals owned
- Where do animals currently sleep?
- What do households feed confined animals?
- Are raw materials or money available to build a shed?
- Do families have the skills to build a shed?
- Would neighbors share a shed?
- Do households have access to a savings group or other source of financing to invest in a shed?

A photograph of a concrete floor with a brick wall in the background. The floor is light gray and shows some faint blue markings. The brick wall is made of reddish-brown bricks and is located in the upper right corner of the image. The lighting is somewhat dim, creating a soft shadow on the left side of the floor.

Improving Floors to Improve Lives

In collaboration with EarthEnable





Data collection

- Observations of children and pregnant mothers to assess exposure to soil-transmitted helminths inside vs. outside
- Sampling dirt on floors for *E. coli*, soil-transmitted helminths, and jiggers
- Qualitative interviews on reasons for and benefits of improving floors



Anecdotal benefits of improved floors

- Improved floors bring a sense of organization to the house
 - Children don't throw trash on the floor because trash doesn't belong
 - Children spontaneously stopped wearing shoes in the house
- Improved floors are cleaned more often and more thoroughly
- Improved floors reduce women's work
 - Sweeping is easier
 - Sweeping kicks up less dust, decreasing the frequency of laundry







Context matters: Unfinished floors in Bangladesh are already smooth and easier to clean

What practitioners can do

- Document existing housing materials and aspirations
- Explore motivations and constraints to infrastructure upgrading
- Evaluate options for floor upgrading
 - Compacting earth
 - Making out of brick
 - Coating with a cement wash
 - Varnishing



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Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS)

Questions? Opportunities for partnership?

Contact Laura Kwong <lakwong@stanford.edu>