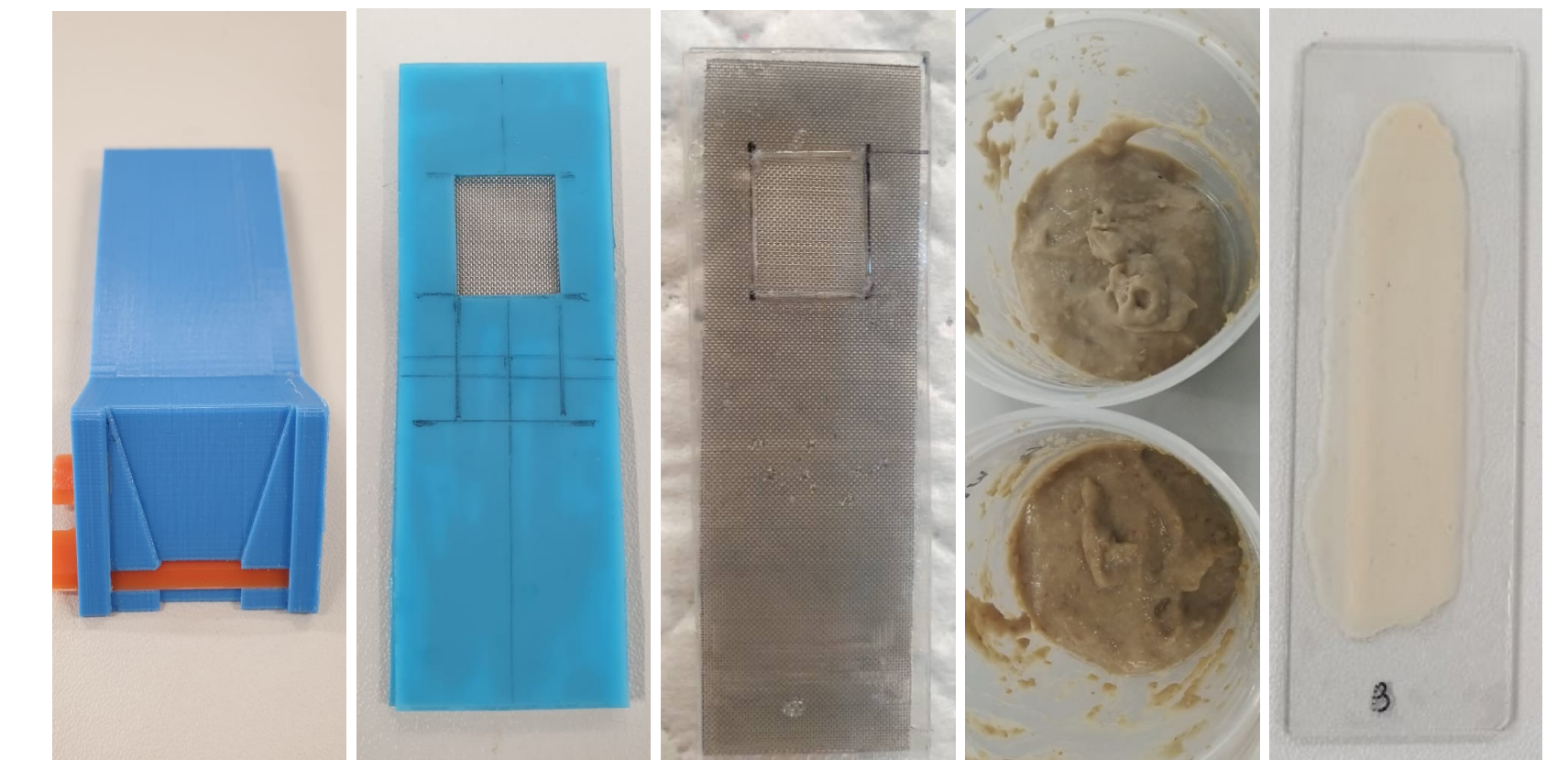
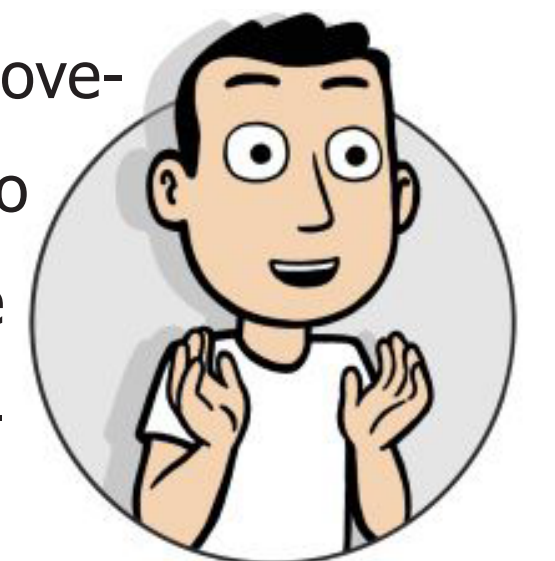


- Schistosomiasis Mansonii, a parasitic disease occurring predominantly in low and middle income countries (LMICs), affects 54 million people, and puts 400 million at risk of infection worldwide. Effects on health range from abdominal pain to cancer, and in some cases, death
- Cycle of Poverty - Cannot afford treatment, and lack of treatment affects their ability to work and earn money necessary for survival
- Cycle of Infection - larvae in water sources infect humans, travel to intestines and lay eggs. Humans relieve themselves in water, releasing eggs (fig. A)
- Organizations like WHO identify endemic areas and undertake mass drug administration (MDA) programs to stop spread
- Stool samples are collected, and 41.7 mg of filtered feces is prepared for microscopy on a 75 x 25 mm glass slide using the kato katz method (fig. B)
- Smear should be transparent enough so the user can read text through it
- Infections are measured in eggs per gram (EPG)



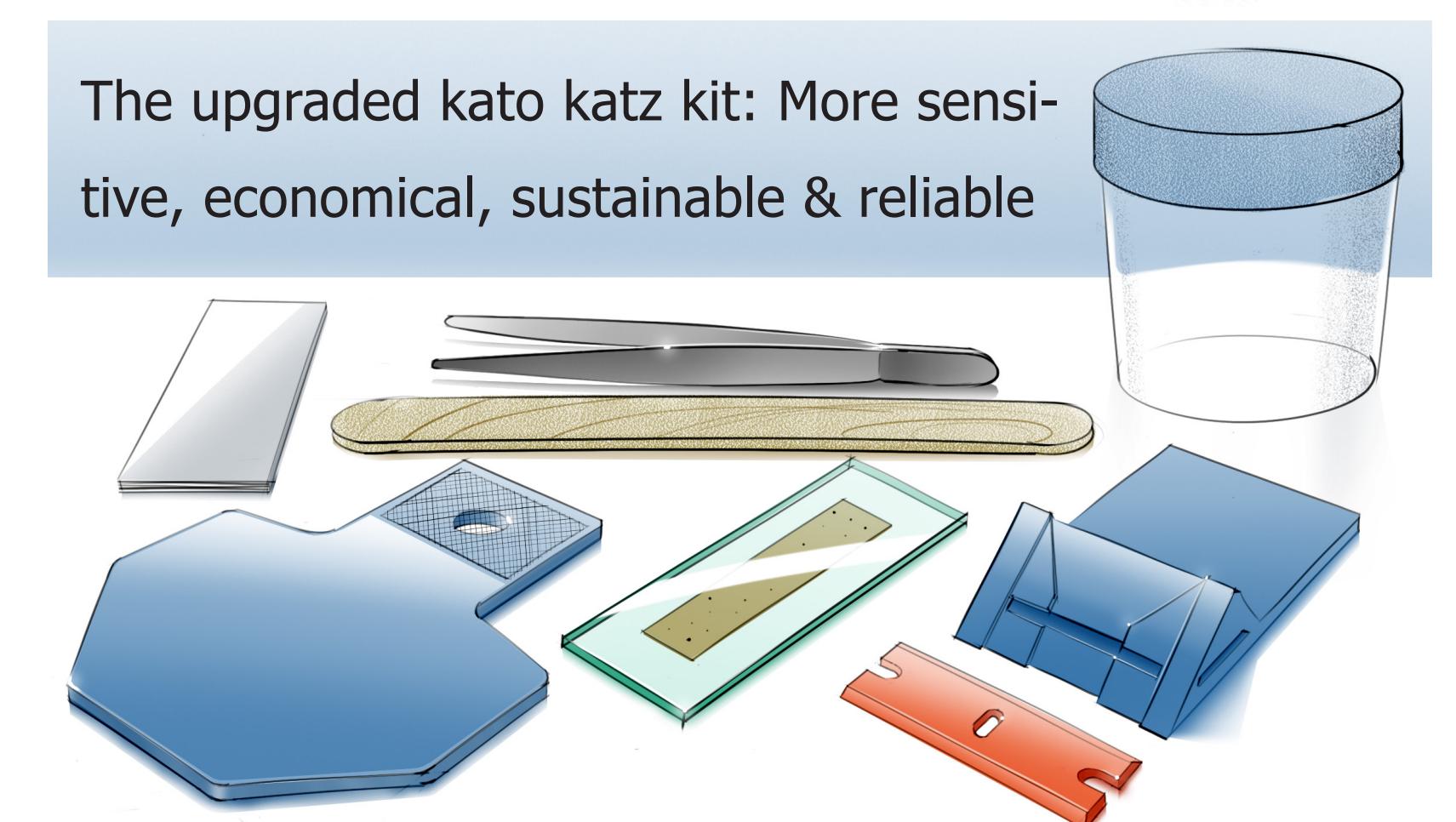
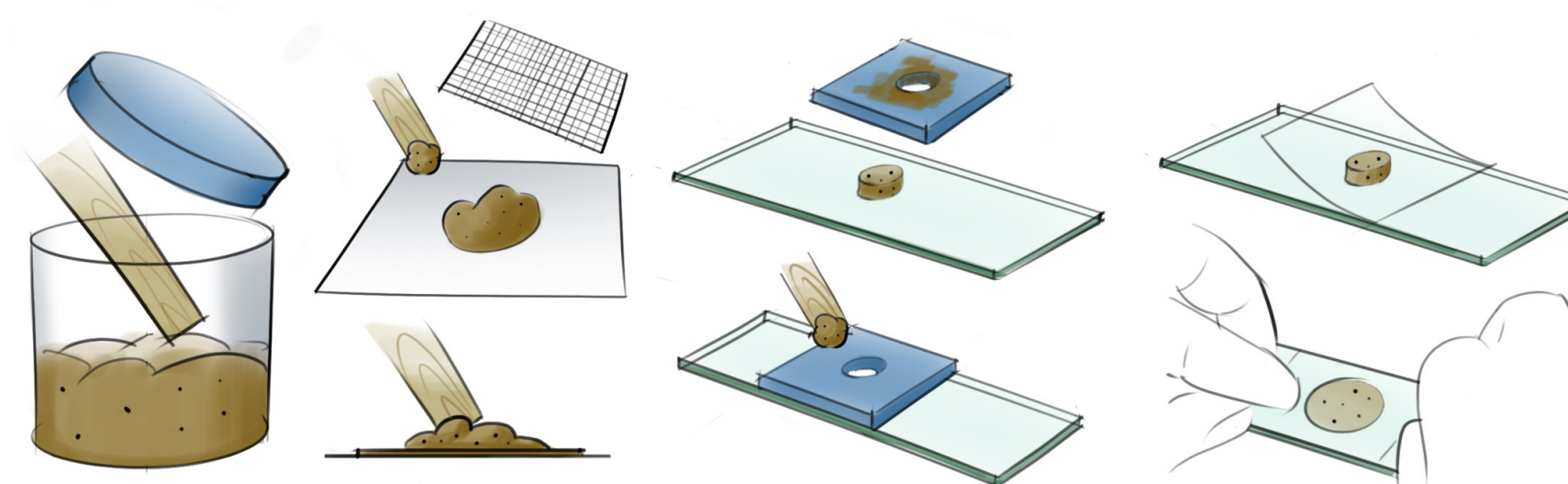
L to R: Draw down smearer (ABS razor blade + PLA hold-er), silicone template filter, polycarbonate template filter, synthetic feces recipe by NASA, slide prepared using new kato katz kit capable of holding 100 mg of feces instead of the standard 41.7 mg. The kit was sent for on-field testing in Nigeria. Actual feces collected for a survey were used to prepare samples by lab technicians. Suggestions for improvement were given. The overall verdict was 'hopeful', meaning if certain improvements were made, the upgraded kato katz kit would be useful on field. The template filter was redesigned according to feedback.



# SMALL CHANGES MAKE BIG IMPACTS

## HOW IMPROVING THE KATO KATZ METHOD WILL HELP MILLIONS

- Kato katz is great for detecting medium and high infection areas, but fails at post treatment surveillance - low sensitivity
- Low, medium & high intensity infections:  $\leq 100$  EPG,  $\leq 399$  EPG,  $\geq 400$  EPG. Current sensitivity of traditional kato katz: 24 EPG
- Research Question: "Can the Kato-Katz method be improved in terms of sensitivity, ease of use, and sustainability, while maintaining current reliability and cost effectiveness?"
- Three goals of the project: Increase sensitivity to 10 EPG (very low infections), increase reliability & use sustainable materials
- Kato katz has two phases: filtration and smearing. 3 concepts are developed for each and evaluated
- Manufactured components must be wash-able with common dish soap, and last for multiple cycles



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AN UPGRADE FOR THE KATO KATZ METHOD  
31-10-2022  
MSc INTEGRATED PRODUCT DESIGN

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