

SUPPLEMENTARY MATERIALS

Integrating user behavior with engineering design of point-of-care diagnostic devices:

Theoretical framework and empirical findings

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This document contains:

1. Study Procedures and Assessments
 2. Future Design Iterations
- Fig S1. Attitudes towards HIV prevention.
Fig. S2. mChip device hardware versions.
Fig. S3. Microfluidic components of self-test kit.
Table S1. Phone usage by participants.
Table S2. Bill of components for “Device 2.0”.
Table S3. Excerpts from qualitative interview transcripts on credibility of results.
Table S4. Excerpts from qualitative interview transcripts on instructions and ease of use.
Table S5. Excerpts from qualitative interview transcripts on perceived usefulness for HIV home-testing.

1. Study Procedures and Assessments

Recruitment and screening took place in person and online using bilingual (English/Spanish) announcements about the study that were distributed at health clinics and gay community events (gay parades, health fairs), posted in authorized areas of gay establishments, reproduced in print media and the Internet, and mailed to participants in prior studies who gave consent to be re-contacted. Study candidates called the research office and responded to a brief eligibility screening questionnaire. Those who qualified were invited to the in-person study visit.

Study visits consisted of a A) quantitative computer-assisted self-interview (CASI), B) a skills demonstration using the mChip (mock self-test in front of the interviewer, no results shown to participant), C) Part 2 of the CASI and D) a qualitative in-depth interview

- A. CASI, Part 1: In Part 1, participants answered questions related to demographics, smartphone usage, sexual behavior in relation to their HIV and syphilis knowledge, motivation to remain uninfected, substance use and concerns that may affect motivation.
- B. Skill demonstration: Participants were asked to use the mChip in a mock testing in which they would not receive test results. The mChip test kit consisted of a disposable blood collector (“Part A”), disposable microfluidic assay cassette (“Part B”), the device, and fingerprick materials (alcohol swab, lancet, gauze and bandage). An iPhone 5 device (Apple Inc.) with the accompanying mChip app was also provided for the study visit. Participants were video-recorded, with the camera focused only on their hands, in order to assess how well they were able to use the device. If they wished, participants were provided with a mask to obscure their face. Participants sat at a table with test kit materials placed in front of them and were asked to use the smartphone app to follow

instructions provided therein. Participants were asked to abstain from asking questions to the interviewer until testing was completed. This was done to make sure that participants could follow instructions and could read the results accurately. Once participants indicated they had completed the procedures and the blank test result screen was shown, the camera was turned off. The participant was reminded that if he or she wished to have an HIV or syphilis test, rapid tests could be conducted at the end of the study visit or that study staff could provide a list of places where testing could be obtained. A structured rubric containing a checklist of required steps and open fields for comments on errors was used to evaluate the skill demonstration based on in-person observations and video recordings.

- C. CASI Part 2: Participants were asked to complete Part 2 of the Web based questionnaire, which consisted of questions about the mChip device, intention to use it and perceived effectiveness and/or difficulty of discussing usage of the device with partners.

- D. In-depth interview: Participants underwent an audio-recorded, in-depth qualitative interview conducted by a trained NYSPI study member either in English or Spanish. A semi-structured interview guide was developed to elicit information on a) potential use of the mChip with sexual partners; b) sexual decision making based on test results; c) potential content for accompanying smartphone app; d) privacy concerns; and e) conclusions and recommendations.

2. Future Design Iterations

We identified critical steps where both device and user-device interaction could be improved: (1) Sample collection and introduction of sample to microfluidic channel, (2) Inserting the cassette fully into the device, and (3) Engaging the bulb of the negative pressure chamber fully for consistent fluidic actuation. Additional sources of error were mainly due to users using the instructional video instead of step-by-step directions in the app for guidance.

Our usability analysis indicates that various approaches to mitigate the main sources of error are needed, which could include: (1) enhanced user-guidance such as additional prompts in the app (e.g. specifying to wait until the instructional video was over to begin the test or recommended time frames to complete critical steps) or adding more audio-visual cues on the device to indicate if a step was performed correctly (e.g. cassette fully inserted into device, vacuum bulb pushed sufficiently); (2) assay refinement to increase tolerance for the variation in timing of steps performed by users, such as incorporation of anti-coagulant or on-chip dilution to counteract lag time between sample collection and assay start time, or (3) engineering design changes such as modifying the slot for insertion of the microfluidic cassette into the mChip device, adding more powerful negative pressure vacuum system to drive fluid flow, automated microfluidic channel priming step (e.g. running a pre-wash buffer) to mitigate flow issues and modified actuation mechanism of the negative pressure chamber (e.g. larger bulb, changing to squeezing mechanism instead of push to engage etc.). Performing usability analysis with target end-users allows us to better characterize friction points and iterate on design choices to increase tolerance for user error or variance in timing of steps.

SUPPLEMENTARY FIGURE 1

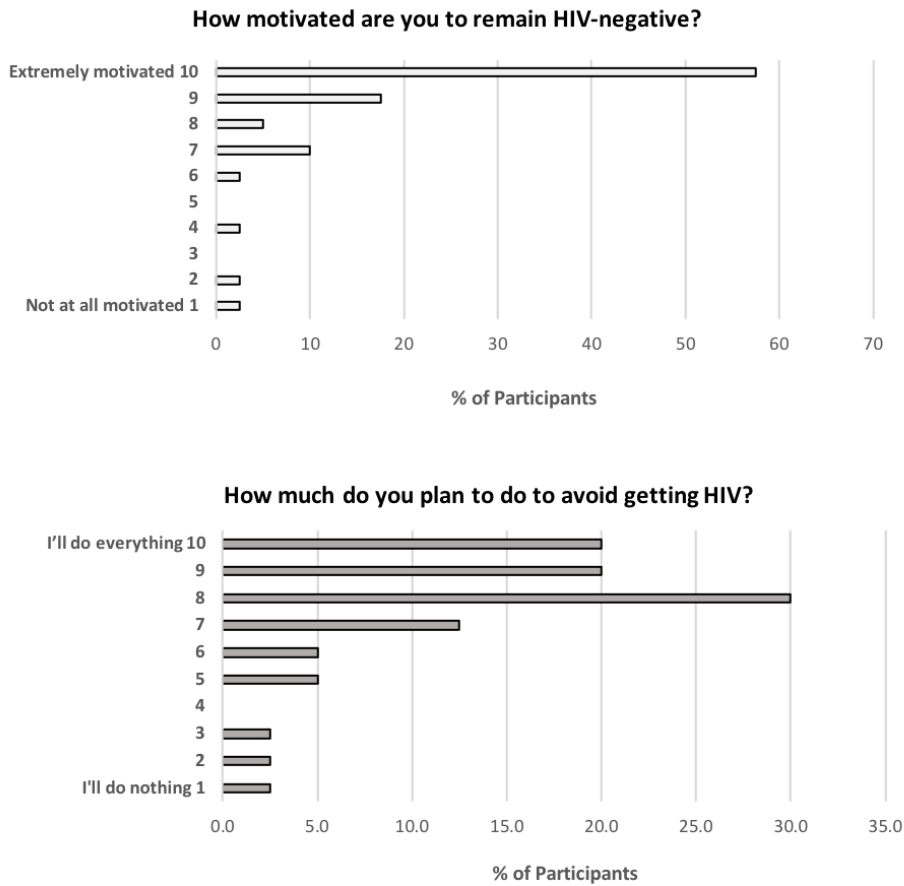


Fig S1. Attitudes towards HIV prevention. Participants' responses to questions on motivation to remain HIV-negative (1-10 scale of not at all motivated to extremely motivated) and how much they would plan to do to avoid HIV infections (1-10 scale from doing nothing to doing everything, including avoiding sexual intercourse).

SUPPLEMENTARY FIGURE 2

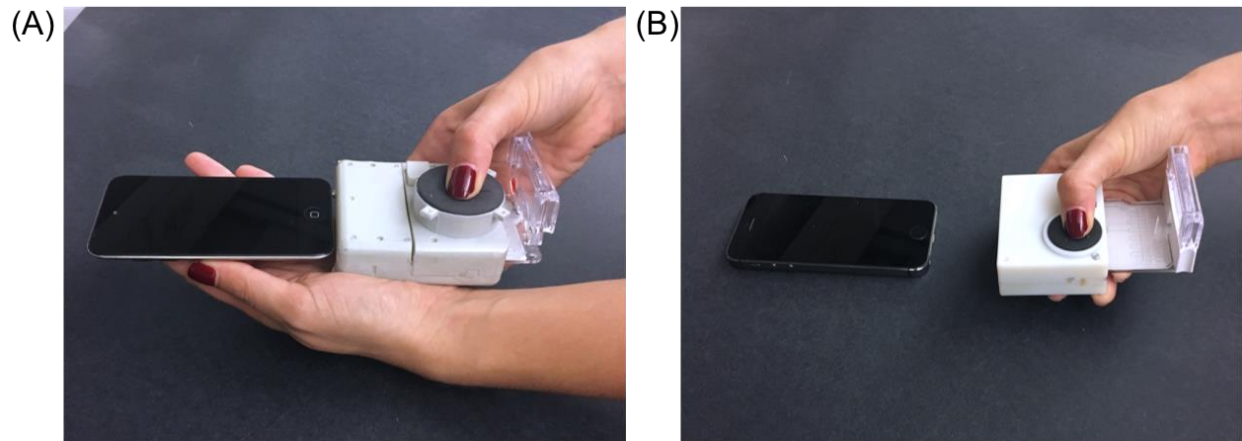


Fig. S2. mChip device hardware versions. (A) mChip dongle device “1.0” was tested in a field trial by minimally trained healthcare workers in Rwanda¹. Device 1.0 measures 7.5cm x 7cm x 5cm, weighs 130g and uses the audio jack of a smartphone for power and data communication through FSK implementation. A 140mL rubber piston syringe bulb was used for the power-free vacuum chamber. (B) mChip device “2.0” was tested by naïve users in New York City for a self-testing use-case. Device 2.0 measures 5.5cm x 7cm x 4cm, weighs 100g, uses a button cell battery (3V) for power and Bluetooth Low Energy module for data communication. A 60mL rubber piston syringe bulb was used for the vacuum chamber. Also, the main changes in the vacuum bulb from previous trials were: (1) rubber bulb from a 60 mL syringe compared to the 140 mL size in the mChip dongle device used in our previous study, and (2) minor adjustments in the height of the 3D printed vacuum chamber casing. Previously the height of the vacuum bulb chamber was 1cm (total bulb height 2.5cm) and in the current design, the height of the chamber was 0.38cm (with total bulb height 1.5cm).

SUPPLEMENTARY FIGURE 3

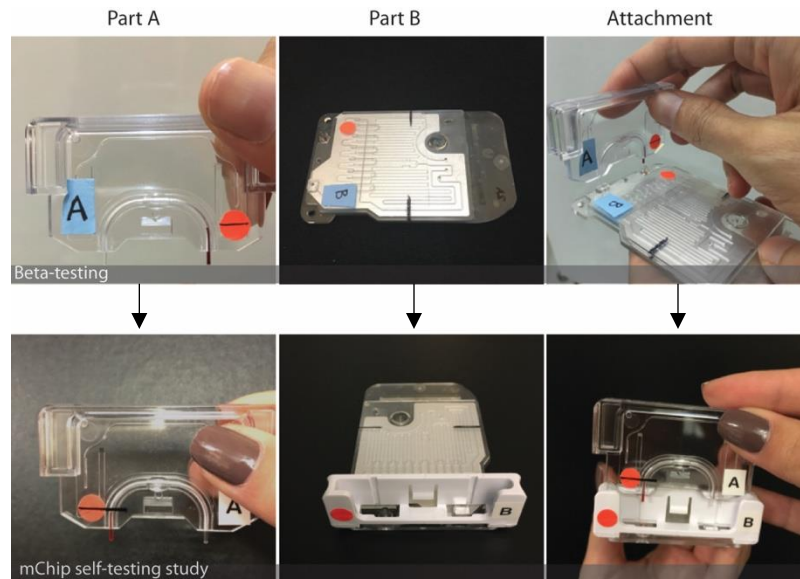


Fig. S3. Microfluidic components of self-test kit. Images showing modifications to Part A, the sample collector, Part B, the combined assay and reagent test cassette as well as attachment of both pieces for naïve-user testing in the mChip self-testing study (bottom row). Microfluidic cassette components were modified to enhance visual recognition and handling through stickers and labeling (“Part A” and “Part B”). We also observed that during beta-testing prior to the self-testing study, users had to insert the tips of the capillary tube component of the sample collector into matching inlet holes of the microfluidic cassette by eye, causing some difficulty in knowing how much force to apply in pushing the pieces together and in some cases, bending the capillary tube tips out of shape. An additional plastic guidance piece was added to functionalized microfluidic cassettes to guide attachment of the sample collector (Part A) to the microfluidic cassette (Part B) through a simple sliding and locking motion. Once attached, Part A and B are locked irreversibly, containing blood within the closed microfluidic circuit and embedded waste pad.

SUPPLEMENTARY TABLE 1

Table S1. Phone usage by participants

Do you own a smartphone?		
	Yes, n (%)	38 (87%)
	No/Not sure, n (%)	1 (2.5%)
	Prefer not to say, n (%)	1 (2.5%)
What type of phone do you have?		
	iPhone, n (%)	21 (52.5%)
	Android, n (%)	19 (47.5%)
Do you use smartphone applications (apps)?		
	Yes, n (%)	38 (87%)
	No/Not sure, n (%)	2 (5%)
How do you use your mobile phone?		
	Texting, n (%)	40 (100%)
	Phone calls, n (%)	40 (100%)
	Taking photos, n (%)	38 (95%)
	Listening to music, n (%)	37 (92.5%)
	Watching videos, n (%)	36 (90%)
	Games, n (%)	23 (57.5%)
	Surfing the internet (including social media), n (%)	36 (90%)
	Email, n (%)	38 (95%)
	Banking, n (%)	25 (62.5%)
	Other, n (%)	4 (10%)

SUPPLEMENTARY TABLE 2

Table S2. Bill of components for “Device 2.0”

Component	Vendor	Part no.	Qty	Cost per (\$USD)	Total (\$USD)
Photodiode	Digikey	475-2659-1-ND	5	0.514	2.57
Operational Amplifier	Digikey	ADA4505-1ARJZ-R2CT-ND	5	1.980	9.90
Capacitor, 0.1 uF	Digikey	1276-1443-1-ND	5	0.003	0.02
Resistor, 300 kΩ	Digikey	P300KGCT-ND	5	0.003	0.02
Resistor, 100 kΩ	Digikey	311-100KJRCT-ND	1	0.002	0.00
Resistor, 35 Ω	Digikey	1276-3914-1-ND	5	0.002	0.01
Resistor, 10 kΩ	Digikey	311-10KJRCT-ND	1	0.002	0.00
636nm Red LED - 1100 mcd	Digikey	754-1786-1-ND	5	0.182	0.91
Thermistor 10 kΩ	Digikey	490-2414-1-ND	1	0.043	0.04
Capacitor, 1 uF	Digikey	1276-1010-1-ND	2	0.009	0.02
10 pin FFC connectors	Digikey	WM6790CT-ND	1	1.013	1.01
10 pin FFC connectors	Digikey	HFJ110CT-ND	2	1.000	2.00
10 pin flat flexible cable	Digikey	WM14313-ND	1	2.420	2.42
Voltage Regulator	Digikey	296-22681-1-ND	1	0.650	0.65
Pins	Digikey	SAM1000-32-ND	0.3	4.913	1.54
Pin Sockets	Digikey	SAM1104-32-ND	0.3	4.959	1.55
Switch	Digikey	EG4934-ND	1	0.457	0.46
CR2032 Battery	Digikey	N189-ND	1	0.184	0.18
Battery Holder	Digikey	BU2032SM-HD-GCT-ND	1	0.755	0.76
Bluefruit LE Breakout (Adafruit)	Digikey	1528-1199-ND	1	15.960	15.96
MSP430f1611 Microcontroller	Digikey	296-17205-ND	1	10.310	10.31
PCB - Photodiode	Pentalogix	Custom	1	0.420	0.42
PCB - Mainboard	PCB Universe	Custom	1	0.420	0.42
Plastic Casing	Injection molding company	Custom	1	3.000	3.00
Rubber bulb - 60ml	Allegro Medical	561516	1	1.000	1.00
Silicone sheet	McMaster	5787T11	1	0.002	0.00
Switch	Digikey	CKN9838-ND	1	2.460	2.46
Viton O-ring 007 (black)	McMaster	8297T117	1	0.120	0.12
Silicone O-rings 011 (orange)	McMaster	9396K16	1	0.150	0.15
One-way umbrella valve	Minivalve	UM100.014-151.01	1	0.830	0.83
Total Cost					58.72

SUPPLEMENTARY TABLE 3

Table S3. Excerpts from qualitative interview transcripts on credibility of results.

Quote	Excerpts
	Blood as Sample Input
A	"It actually gives me more reassurance than the saliva. Because if it's through blood, that means it's testing for -- I'm not sure, but is it the antibodies?.."
B	"..I just always feel like blood work over oral things is always more efficient and more, I guess -- how would you say it? I guess I would believe it more if it was done with blood work, because I know it's coming right out of my body, instead of oral. And if anything can mess with your oral, in your mouth. So I feel a little more confident with the blood.."
C	"... I mean, I just feel like blood tests are accurate..."
D	"...I definitely would be more apt to use it if it were not blood-based, but for the same -- I would say that there's a certain level of stronger confidence I have -- and maybe just because I don't know anything about science -- in my head, you just get a much stronger and more definitive read off of blood than saliva or piss and so that -- that gives it a degree of confidence. Like, this is a real test..."
E	"... It was very -- from my understanding, it was very legit because it has you take your own blood. You put your own blood in the little dot, and then you wait a few for it to get your results. It's just like any other test. It's just a little faster..."
	"...From my experience, that is actually a lot more legit than a swab, because a swab -- it can come up error. You know the devices, they come up sometimes -- error. But this is blood. So, it's going to come up exactly what's in your blood..."
F	"... Because it's using my blood, right, to determine -- my being positive for HIV or being negative for HIV. So the fact that it's using blood that I personally did on my own, I don't see why there should be anything besides the correct answer. So I think it was cool..."
G	"...is actually using blood for testing. I would believe it would be more accurate as opposed to just the oral swab..."
H	"...Well, pro-- it's blood, so yeah. I would trust it more..."
I	"...HIV tests have been around for some time. I've been taking them for some time. I know a little bit about them, and have confidence in their accuracy. I've actually discussed it with my doctor in the past about home tests versus having blood drawn and --And he said they're pretty much the same, as long as you don't contaminate it...."
	Negative Results or Confirmatory Testing
J	"...if it told me something -- if it was negative or something, you know, or it's positive or something, then, I mean, I would believe it. I would probably do a retest, but I would believe it... "

K	"...I mean I'm really content with it being negative, because you know, by you know, the way I perform when I, you know, when I have sex and stuff like that, I mean, most of the time I'm, you know, protected, you know what I mean? So I would hope to have a negative result. But if it was positive, I mean I'd go out and seek, you know, you know, assistance from like, you know, like a therapist or something like that, but as far as that, I'm confident..."
L	"...Well, I would say because I know that I'm going to be HIV negative or syphilis negative because I test myself regularly. So, when I did that, I was like, "I'm pretty confident that it's going to be clean," but I don't know the results yet because you're not allowed to share it with me. ..."
M	"...Well, I think, if they were negative, (laughs) I would be -- I would take it for face value, and if they were positive, I would naturally go and get another test..."
N	"... (confident in results) because most of my sex lately has been on the safer side..."
O	"...I would certainly trust it enough to move on to a doctor if there was a positive result or assume that it was correct if it was a negative result..."
P	" I don't really have a lot of oops kind of situations, but I would like to have one for either myself or others. I'm very picky about my partners. I tend to go on intuition..."
FDA Approval/Accuracy Information	
Q	"...if it were FDA approved, that itself would give me pretty strong confidence. I don't think that my confidence in my handling of it would make me question whether I did it right and I'm actually getting the right results and I feel pretty confident that the FDA wouldn't approve a device like that if it didn't give an accurate reading, so I would be pretty confident in its accuracy..."
R	"... I know research, and I know that these things, before they get to this stage, take a long time. And they do what they do, they revise them 100 times if they have to. And so, I'm confident in the medicine, and the field of medicine..."
S	"... know that HIV testing -- I know that there's not a product that will come on the market that wouldn't give me an accurate test result..."
T	"...I guess I would trust it, if it's FDA approval, I would -- I would trust it...If they had, like, a box on there with the information, like, saying what it is. Like, you just can't -- don't just have this on the table. You have like a box that it came in, explaining to you, like, if I would be able to trust in something like that."
U	"...It would depend on what I had read about it. You know, if it got approved and they said it's 99 percent accurate and I would want to know those things, I would believe what it told me..."
V	"...this one hasn't been approved by FDA just yet..."
W	"...If it had been approved and was in production, then I would feel confident that it was as good as any other test..."
X	"...I mean, I assume if it makes it to market and it's like widely available to somebody that that's been tested and that the accuracy is high..."
Device/App Feedback	

Y	"...I'm not sure about the app, how it works, and this one -- it did not indicate any lights or anything that it's working or not. So, yeah, I was not sure if it's, you know, going to work out well, right, or not..."
Z	"...I missed a step and then I traced back, so I don't know if in fact it got contaminated and therefore produced an invalid result..."
AA	"...But there's always the chance of me having an error or doing something maybe wrong, and having maybe the test tell me something that it didn't mean to..."
AB	"...it looked like it worked, and it looked like it's efficient..."
AC	"...It's a prototype... "
AD	" I guess I'm confident in the design that that is well thought out and that if didn't work, it'll give some sign of not having worked..."
AE	"...It's just a little mumbo-jumbo", "And I'm not even completely comfortable with computers..."

SUPPLEMENTARY TABLE 4

Table S4. Excerpts from qualitative interview transcripts on instructions and ease of use

Quote	Transcript Excerpts
A	"(compared to OraQuick)..It's less steps to do. More quicker. It's... It's more up-to-date, where you can use your smartphone to do it. A lot of people own smartphones..."
B	"...It's simple to do too. Like the steps -- once you watch the video and you do it, like, it should come to you naturally, because it's simple. It's basic..."
C	"...It's small, portable, easy...and it has an app..."
D	"... It's fairly easy to do. Once -- you know, I'm a pretty good eye. Once I saw the video, and I knew what to do, it's like, it's already there. You know, so I don't need to see the video again. You know?"
E	"... I think the device was easy to use, the instructions were crystal clear, and I liked the step-by-step so I knew exactly at what point of the process I was in"
	"... It's easy enough for anyone to use. The instructions are crystal clear and you can do it any time of the day or night, which I think is important."
F	"...(advantage is) that it's got an app...Everybody's so techno these days."
G	"...It was easy. So actually it was easier than the ones that are currently commercially available. Like I have an OraQuick and I haven't tested myself, but I tested someone with it and it was actually more difficult. Like it was a little more involved -- self-involved. Like if -- in the sense of like, if something -- got contamin-- it could get contaminated more easily, per se. And this one is just like very quick, yeah..."
	"...It was fairly easy to do. Once you follow the instructions, I pretty much felt was a little bit easier than doing the OraQuick. It was actually much faster to comprehend what you had to do. I like this test. I like the simplicity behind it..."
H	"... also having the app coach you through the steps. It was pretty cool. Getting the results on the app was actually pretty cool. It was like you get a little more accurate than you would interpreting the lines on the other test. So at least you get a faster, more accurate result. So I like that. (even though you didn't get actual result today) Yes, of course. Of course you didn't get a but having the app tell you negative or positive, instead of you having to decipher if there's one line or two lines, or one line is visible. It's a little more comforting to know..."
I	"I thought that -- I mean, it was relatively simple. Somehow, watching the instructions, I thought it was going to be harder. But it's, you know, essentially just pricking yourself and putting the -- I don't know the terms, but putting piece A to the blood and then inserting it. So it was really easy to use. "
J	"...I felt like sometimes the screen instructions were putting two steps into one screen. And I think it's just when I'm absorbing new things, I think more screens - - you know, and just having one step and one picture, and then, like, it just makes it easier to follow..."

K	"...The whole test was simple and easy. I thought the steps showed me exactly what to do and I followed it and I did it..."
L	"...I watched a video. I saw how it works, and it was pretty simple steps..."
M	"...Everything was pretty straightforward. There were, like, guidelines on -- like, there's a black line across here. There's two orange dots to, like, line these up. I mean, everything is very visually clear, as to what you need to do, to make -- to, like, make it work. And it seems like I did all the things right.."
N	"...Even just having seen the video first, I knew what the next steps were, was going to be. I think it's good to have both, like the overview and the step-by-step. I think that was a smart way of doing it..."
O	"...Well, I would say what makes me feel confident, especially after watching the video and completing every step myself was the fact that I was able to follow through. At first, I was intimidated. I didn't think that I was going to be able to follow through and be able to work the device myself, but it was easy as one, two, three, and as I joked around at the end of the one that I have done with putting the device together and testing myself, I had made a joke that if I could do it, anyone could do it. And to be honest, I think that anyone that pays attention, or I would say, anyone that watches the videos and pays close attention to the details will be able to fly right through it. It's pretty simple, and then like I stated, I believe that even a young child that's given exact knowledge and the exact details on how to operate the device would be able to use it as well..."
P	"...Because I followed the instructions step-by-step. Really, I looked at each one step-by-step, and it was like "Okay, this one was supposed to do this, this is where this is supposed to go..." and the language was clear..."
Q	"...It's very simple, very easy. Anybody can learn it. The directions are very strict and direct..."
R	"...because the steps are divided up, and after you complete a step you go on to the next one. And you know you've done it correctly, because there's pictures. There's instructions about "Match this to this." So you really can't get it wrong..."
S	"...Generally, I felt like the instructions were clear and that I could be confident that I had followed them correctly..."
T	"...I mean, the steps correctly show me that it was easy to do. It wasn't something that I had to be a rocket scientist to figure out..."
U	"...The instructions were fairly simple. It wasn't something out of this world. It asked you to do step one, step two, step three, step four, step five, all of it in a timely fashion. So it wasn't like you have to figure out or scroll back or anything. It's just there, do this. There, do that. There, do this. So it felt a little bit easier, because when you're with the OraQuick, sometimes you have to go and read the cards or check the cards

SUPPLEMENTARY TABLE 5

Table S5. Excerpts from qualitative interview transcripts on perceived usefulness for HIV home-testing.

Quote	Excerpts
Circumstances of Usage	
A	"...(Can use this) in the privacy of wherever.."
B	"..I would use it at home. .."
C	"...I would use it every two weeks at my house, home, privately, but I would not use it, you know, during the hookup, like go to where I'm going to hook up with -- and use it in front of him, because it might kind of creep him out..."
D	"...I suggest you use it at home, but you also always have a little kit with you that you can keep it on you. Because you never know what your day may bring by..."
	"... Home base for self. And for partner, I wouldn't surprise this on anyone....If I carried it to a partner or carried it out of my personal uses, it would be premeditated."
E	"..But my goal would be for (partners) to learn doing the kits on their own. You know and this way they can also acquire the test and you know maybe when they're not -- when we're no longer together, this person -- I care enough for this person for them to be safe with someone else. You know, so that would be my goal for them to learn, teach them.."
F	"... I would say primarily for testing myself on, you know, whatever schedule I sort of had worked out with my doctor about what was a reasonable frequency for getting tested, that I would otherwise be going somewhere to get tested and I could just do that more easily myself at home. And potentially, I would talk with my partner about coordinating -- maybe we would do it at the same time, to sort of hold each other accountable to keeping to that schedule or something, it would be easy to do that together..."
G	".. in my privacy, in my house. In a room. In the privacy of my house, or somebody else's house, if need be..."
H	"...at home in my own privacy..."
I	"...My home or someone else's some, I know it's in my possession. So, I'm not worried that it's not like anywhere else besides it's my possession. Again, it keeps up with my privacy..."
J	"...Sitting on my floor of my living room with the carpet, right in front of my television..."
K	"...To me, saves me a trip going to the doctor's if I needed to get tested. I can do that at home, like I said. I can do it while I'm getting ready for my date, making my coffee and toast and eggs. Literally, I can do that while I'm waiting. So it's convenient that way. I won't have to put -- cancel appointments or anything like that, or schedule around going to a doctor's visit. So it definitely has that..."
Portability	
L	"...It's very, very, very, very portable. It's very portable..."

M	"... one other advantage that occurred to me is that this is actually smaller. So the OraQuick -- I mean, if you actually have an OraQuick, it's actually sort of bulky. If you bring two OraQuicks with you, it's sort of bulky. So I was, like, going around the city one time, and I -- it was just a lot to carry in my bag. So in a way, there's sort of a portability advantage there..."
N	"...It's pretty small. It's portable. It's not hard to carry around. You can put it in your bag, not in your pocket, though, no..."
O	"... I would say basically, the device is small, compatible, I could put it in the opposite side of my jeans pocket that my cell phone may be in; I could put it in my jacket pocket, or the inside of my coat pocket..."
P	"... I see that it's a lot smaller than the older swab. (the whole case thing). The whole case thing, that is like either it's uncomfortable, just showing it to somebody it can be kind of scary, you know what I'm saying? You're bringing out the big box and you've got to open the box and you've got all these different assessments that go with the box and stuff like that. This (mChip device) would be helpful. It's better with being portable. I know I mentioned about the -- I wish it was, because -- these days we want things to get smaller and smaller and smaller, so this is great on that..."
Q	"...It's much smaller than any of the other tests. So it's more compact..."
R	"...It seems pretty portable. You can take it a lot of places -- again, at your cruising spot, or someplace where you may not even expect to have sex, but you -- it just may come up, based on a connection with a person. It allows for it to be carried that way..."
S	"...The advantage is that it's really small, and compact, so that you can actually bring it with you, if you go out...This is certainly something you could just throw in your pocket, or whatnot. Gym bag..."
T	"...The compact feature of it, it's quite tantalizing. You can actually store it in very small -- you could even, say you could put this in your pocket...You can put this into a separate little pouch or container that's no bigger than your cell phone. You can put it in a pocket and take it with you. You can take the extra cassette tests to a different partner, and it doesn't cover that much space. Space is valuable when you're transporting stuff. I love OraQuick, but I hated the fact that I had to carry my book bag in order to carry two kits with me. But with this, you can just have it in your pocket and have it without too much bulk on yourself. So I love that..."
U	"...t should be in a little -- like a little case, discrete case, so you can put it in your backpack or whatever. Man bag. .. "
V	"... I could see it in like a book bag, it's probably, I'm not sure if it'd be heavy for the pockets. It kind of is a little. You know what I'm saying? But I could see it being in a little kit or something. You know, one of them little zip up kits, you know..."
W	"At home. When I was reading about it before about this like on the road thing that seemed a little much. Because it seems fragile and stuff like that. Doesn't seem like a great travel thing..."
X	"Well, it's pretty clunky and like even something very, very small ends up with pretty large packaging, so with all the stuff that would come with it and all the packaging for that you're going to end up with like a pretty big package with a lot of different little envelopes and thingies. So it just to me, it would be easier to get it at the destination point..."
Syphilis	

Y	"...Advantages is that you can get your HIV and your syphilis results, which normally you'd have to have two separate tests..."
Z	"...You get two results in one. That's the big advantage..."
AA	"...The most obvious advantage is obviously the ability to test for syphilis in addition to HIV...But right now, the most clear is syphilis. I'll be honest with you. Like, when I took those tests, when I was doing the questionnaire earlier, I realized how much I don't know about syphilis..."
AB	"...I like the way it works, because it tests two kinds of STDs, HIV and syphilis..."
AC	"... I think the syphilis part will be well received. I think now, there's, I want to say a lull in people getting STD screenings, because syphilis now is a blood draw. And folks, be what it may, are still afraid of needles. And so, if you can get a syphilis result from a finger stick, that's still reduced blood draw, will make it easier for folks..."
AD	"...I like this actually, the fact that the syphilis part, because I never had it -- I never heard of a syphilis home kit. A home test kit. So this is -- this is something new, I -- this is very interesting. And, like, I like the -- I like the fact that it's syphilis. Because they have many HIV things going on, nowadays, but this is -- and for syphilis, this is great. I wouldn't -- I wish they'd come out with something for chlamydia and gonorrhea..."
AE	"...It's fabulous to be able to know on the spot if you or somebody else has -- someone you're with -- has HIV or syphilis. I know all about HIV. I don't know that much about syphilis..."
	Smartphone Integration
AF	"..If I can link this up with my physician and say, "Hey doc, I'm about to test myself." And the doctor says, "Okay, I'll have the results when you test." I'll be more likely to take my tests in the comfort of my own flat than I would go to my doctor's office to test. I would do it in my own home only if my doctor can be like, "Oh yeah, I see it here. We'll discuss your positive tests, or negative tests, or lack of tests when you come in next. You'll see me sometime in a week..."
AG	"...It's more up-to-date, where you can use your smartphone to do it. A lot of people own smartphones..."
AH	"...I think the other advantage that I was sort of struck by was, you know, the (potential) ability to, like, load test results to dating profiles and to load test -- and to be able to text results and have that be some kind of automated feature. You know, that could create -- that seemed like a cool advantage to me, just having a smartphone app, and having sort of like a tracking thing..."
AI	"...it has an app. And since everybody is really, you know, into technology and on their phone all the time, I think the app, to know the results and have it saved on your phone and you can share it with your -- whoever you're going to hook up with, Grindr or whatever. That's why I think it's really good to have, especially with the app..."
AJ	"... I also like the smart phone app aspect of it. I think that's really cool and smart..."
AK	"...everybody's on their phones. And so, this phone technology seems really easy to have it readily available, I think it's amazing. I think I would definitely use it to test potential partners. I mean, it goes along with -- if you're on the app, you're on your phone..."

AL	"...You can't lose your documents like you would do at a regular -- any other test. You know how they give you a paper? This goes straight to your phone, and nine times out of ten, your phone is backed up to your email. So, even if you lose your phone, you still have your private information..."
AM	"... Results are, I guess, logged on your phone. Could be useful. (in what way?) I'm not sure if it's necessarily good or bad, but, you have a track record of your results, so I guess that could be seen as a good thing, you know? You have your results that you were tested recently..."
AN	"...Everybody -- pretty much everybody has a smartphone..."
AO	"...the good part of the device to see the results is your phone. And most -- nowadays, myself included, most people have their phones with them everywhere they go. So, people use phones to pay bills and do a lot of things, so to use a phone now that's going to tell you your results is a really interesting way of utilizing it, so I think that's really cool..."
AP	"...Well, the smart phone thing is amazing. That's amazing, because then you can just send it, and it's there. Because most of the time, that's the hard part is, like, results. Like, people say they're negative, and then you're like, "Well, where's your results?" And then you're like, "What do I do? Do I show them a picture? A paper? A screenshot of --" you know. And I don't think the oral swabs have, like, a phone -- You know, a Bluetooth thing. So that's -- you know, so the pros outweigh the cons. But I think the appearance of it is a little too -- is a little medical, as opposed to casual..."
AQ	"...(Advantage is) that it's got an app. (laughs) Everybody's so techno these days."
AR	"... having the app coach you through the steps. It was pretty cool. Getting the results on the app was actually pretty cool. It was like you get a little more accurate than you would interpreting the lines on the other test..."