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End-user research into understanding perceptions of and reactions to a microarray patch (MAP) for contraception among women in Ghana, Kenya and Uganda
Community engagement on microarray patches
Moushira El-Sahn, Routes2Results
May 2024



Introducing our research on MAPs as a form of contraception

A three-staged research flow across Ghana, Kenya and Uganda.
We discussed MAPs with 1,062 women across all phases



1

2

3

**Urban 5-hr Mini-workshops + QuickFires®
and Provider immersions**

exploratory + broad strokes

Mini-workshops
Total n=75 (n=25
pc)

Immersions
Total n=48
n=18 docs +
nurses n=12
CHWs

**Rural Qualitative 45- minute
In-Depth Interviews**

deep diving + indicative

Total n=60 women (n=20 pc)

**Quantitative Face-2-Face 30-
minute surveys**

validating + representative

Total n=927 women
Ghana n=315
Kenya n=303
Uganda n=309



Our strategic goals

Primary goal

Product

Provide feedback on MAPs' product-based attributes to inform early technical design of 5 MAPs in development

Secondary goal

Value Proposition

Understand stimuli and profile impact: what's positive, what's challenging and what is the value of MAPs

Tertiary goal

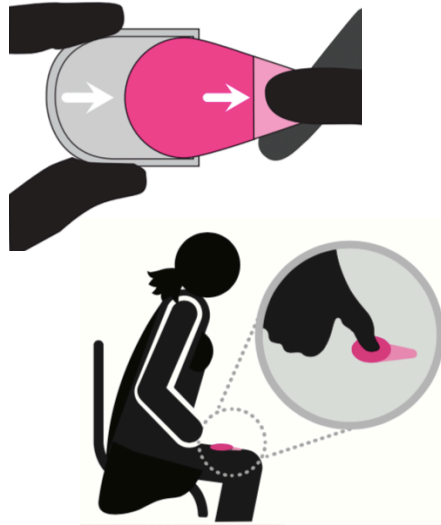
Trial

Gauge perceived likelihood to try and if there are any specific characteristics of potential end-users

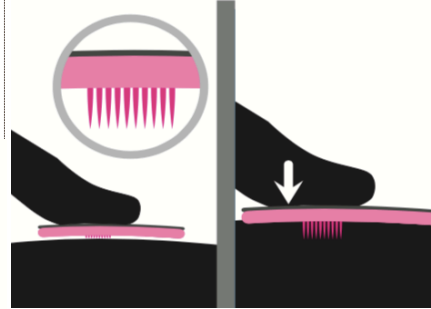
Introducing MAPs to respondents who have never seen a MAP before



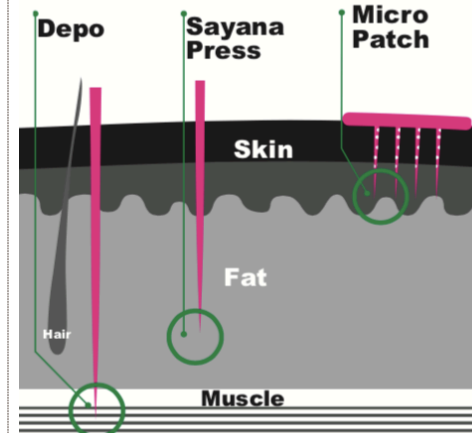
- The new contraceptive is applied to your skin.
- It uses a patch which is like a plaster.
- This patch has extremely small tips (not visible to the eye).



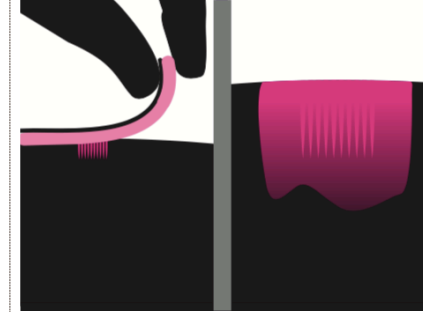
- To use this contraceptive, we simply remove the product from its safety packaging and press the plaster into the skin with a bit of pressure.



- When using a bit of pressure on the patch, the extremely tips go just under the skin.



- The Depo injection goes into the muscle, the Sayana Press goes into the fat layer, and the patch goes into the skin layer, avoiding both the fat and muscle layers.



- You remove the patch and the tips, once in the skin, stay there, until they are dissolved over the course of the contraceptive duration.
- Once the protection ends, there will be nothing left under the skin.



Primary goal – Product attributes

- ✓ Out of the 12 product attributes our research explored end user preferences across the countries and users aligned and offered clear guidance on how to develop a contraceptive MAP regarding shape, size, location, feedback signals, duration, menstruation and application impact



PHOTO CREDIT: R2R OWNED

- a hand-applied circular patch
- ~ 2cm in diameter,
- self-administered,
- within a few seconds*
- with sticky backing,
- to the upper arm,
- sensory feedback signals (click sound/colour change) at application and removal,
- With a sensation of prickles against your skin; briefly uncomfortable, but can be ignored*
- No visible skin irritation afterwards*
- 6 months pregnancy prevention
- 6-12 months return to natural fertility
- regular periods

is the most widely preferred attribute set.

* Data from MaxDiff exercise – please see Frontiers article for full explanation and data

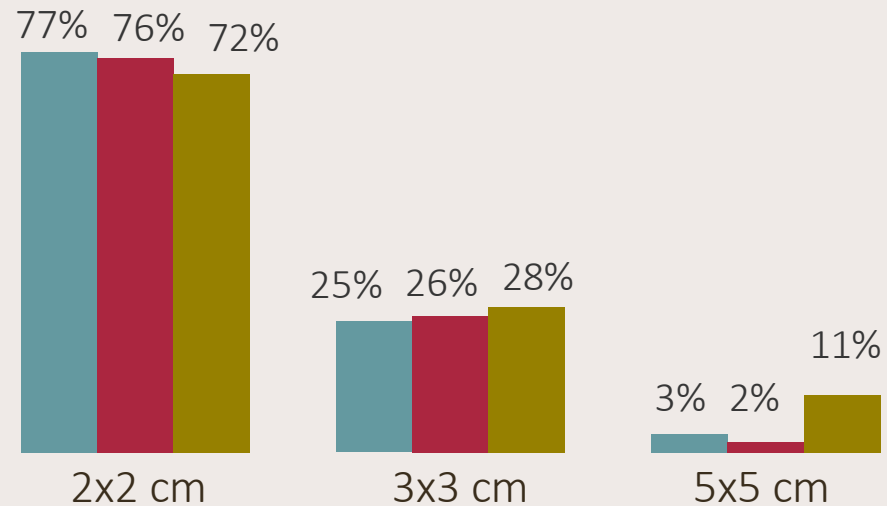


Majority of women prefer 2x2cm size and a circular shape

Preferred size of MAP

% of women

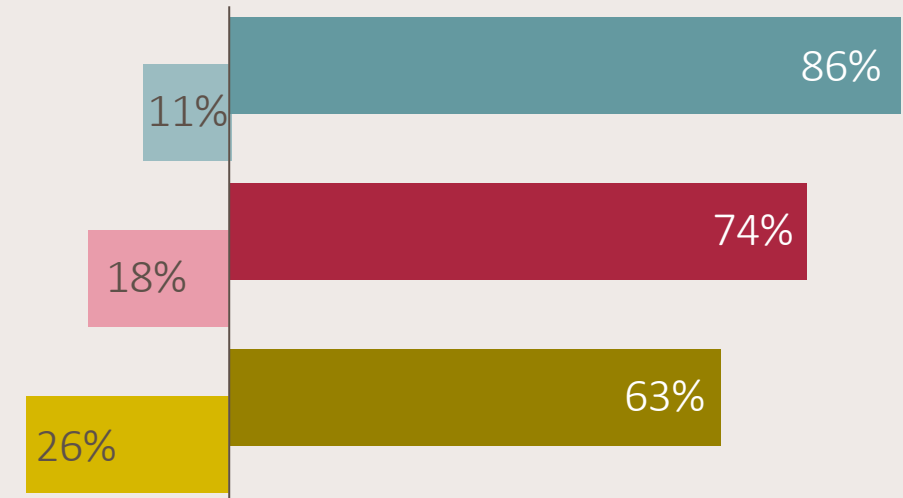
Respondents shown images of patches to scale



Ghana (n=315) Kenya (n=303) Uganda (n=309)

MAP shape preference: rectangle versus circle

% of women



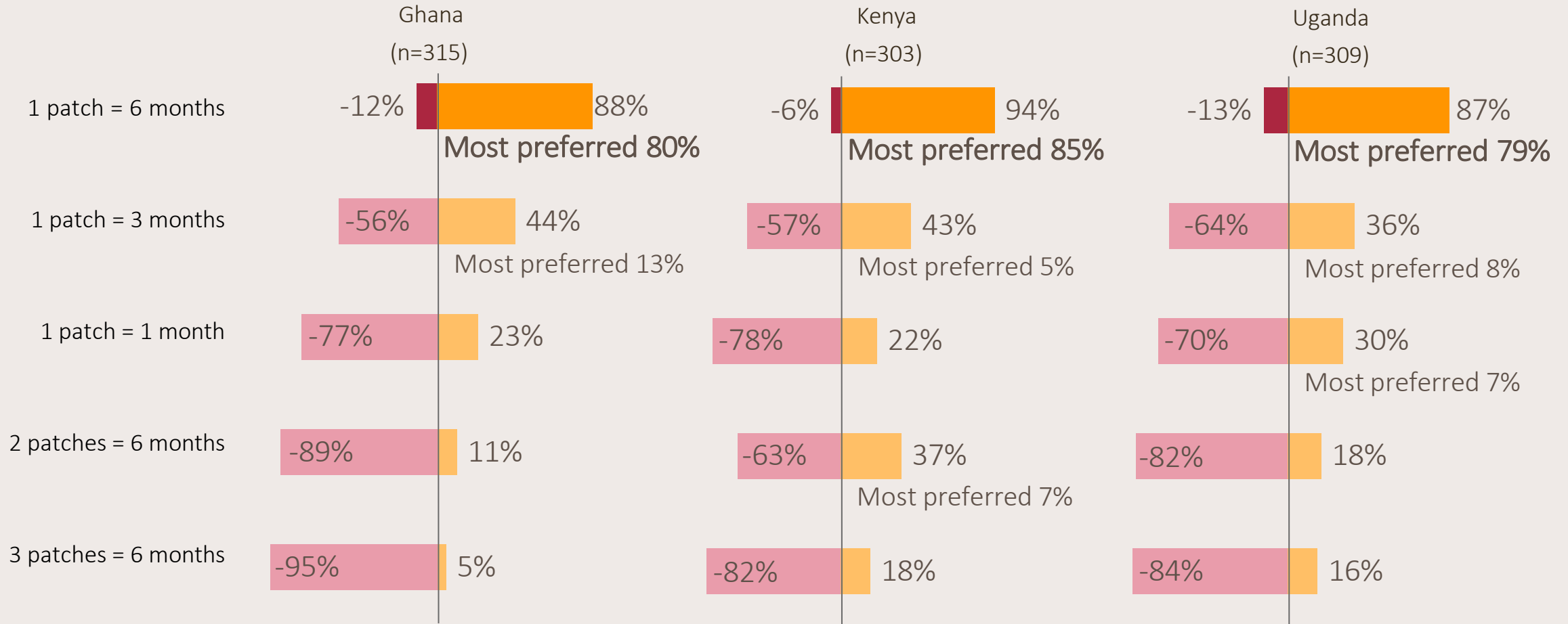


Multiple patches are not acceptable

MAP number of patches + duration acceptability

% of women

Unacceptable  Acceptable 





Arms are the overall preferred location for self-administering a MAP

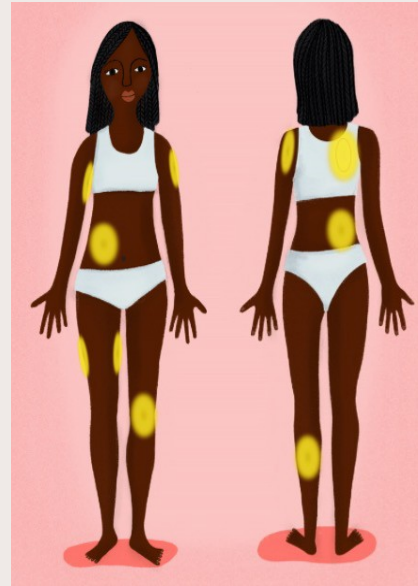
Where women would prefer to administer MAPs

% of women

	Total	Ghana	Kenya	Uganda
Total Sample (n=)	927	315	303	309
Upper arm (outside)	31.0	24.8	31.7	36.6
Upper arm (inside)	29.1	30.8	30.4	26.2
Upper inner thigh	10.7	12.4	10.2	9.4
Stomach (left or right)	9.3	10.5	11.6	5.8↓
Upper outer thigh	9.1	5.4	8.3	13.6↑
Shoulder	3.6	6.0	0.7	3.9
Knee	2.0	1.6	2.6	1.9
Upper back	1.9	2.5	1.7	1.6
Lower back (left or right)	1.8	4.4↑	0.7	0.3
Calf	1.5	1.6	2.3	0.6

↓significantly lower than the 2 other countries

↑significantly higher than the 2 other countries



Body map designed for this research

Reason for area preference / lack of preference

Qualitative discussions, n=137

Areas preferred
considered

Easy to apply,
Familiar, Discreet,
Depends on
intimacy levels

Areas not preferred
considered

Difficult to reach,
Delicate,
Too obvious,
Too private



Colour change and clicking are the most desirable sensory feedback mechanisms across all stages

	Total	Ghana	Kenya	Uganda
Successfully applied to the body				
Colour change	43.4	45.1	42.6	42.1
Clicking sound	34.3	35.2	34.3	33.3
Images appears on skin	6.7	8.9	4.3	6.8
A dye appears on skin	4.3	4.8	5.9	2.3
All signals	5.4	2.9	7.6	5.8
No signal	4.3	1.0↓	4.3	7.8
No preference	1.7	2.2	1.0	1.9
Enough pressure applied				
Colour change	31.4	29.2	37.6↑	27.5
Clicking sound	40.0	47.3	39.6	33.0↓
Images appears on skin	12.0	11.7	7.9	16.2
A dye appears on skin	5.8	3.8	5.3	8.4
All signals	4.1	2.2	5.0	5.2
No signal	4.2	3.2	2.6	6.8
No preference	2.5	2.5	2.0	2.0

	Total	Ghana	Kenya	Uganda
Total Sample (n=)	927	315	303	309
All steps complete – OK to remove				
Colour change	33.5	40.0	36.0	24.6
Clicking sound	30.6	33.0	29.0	29.8
Images appears on skin	8.7	10.2	7.6	8.4
A dye appears on skin	5.6	3.6	10.2↑	3.2
All signals	8.4	3.2	9.2	12.9
No signal	9.4	6.7	6.3	15.2↑
No preference	3.7	3.5	1.7	5.8

↓significantly lower than the 2 other countries

↑significantly higher than the 2 other countries



Three out of the 12 product attributes explored illustrated the need for options.

There is space to allow for variation in MAP designs, if the design promotes and reflects the needs and expectations of users and providers.

Although there is consistency in product attribute choice/preference, a variety in responses exists whereby some (~up to a third) prefer another attribute/design option.

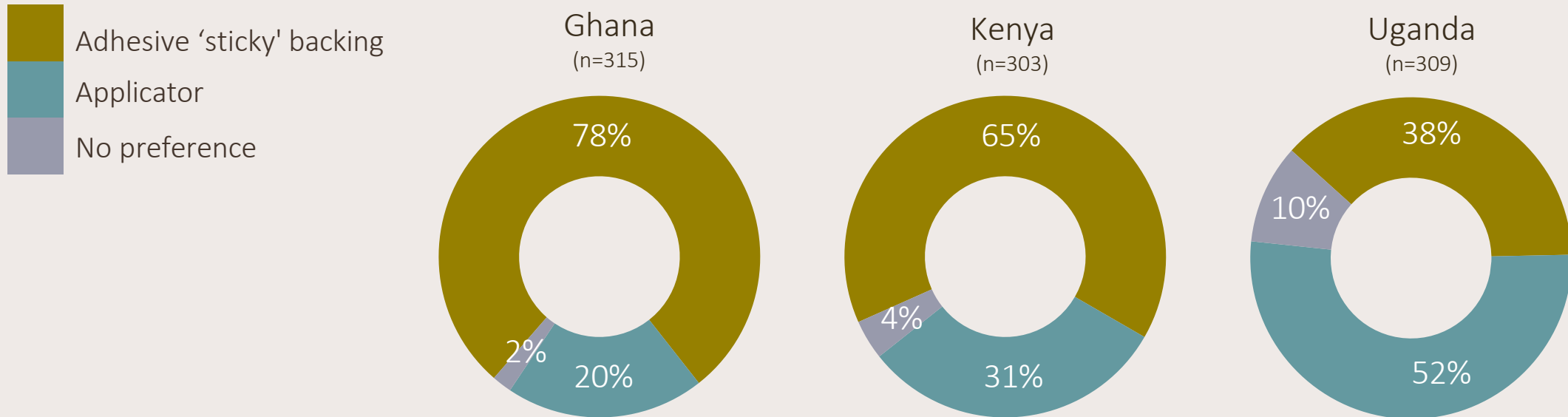
We will look at two of the three now ...



Most prefer hand-applied, sticky-backed MAP.
Except Uganda, where half of women prefer an applicator

Application preference (sticky-backed by hand vs applicator)

% of women





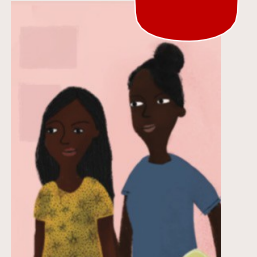
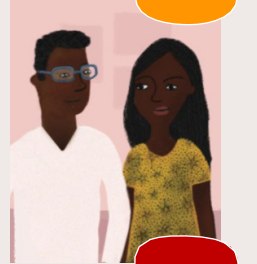
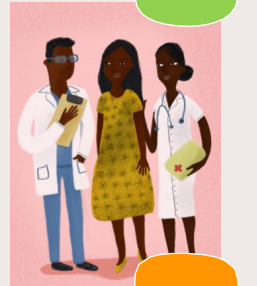
Vast majority in Ghana and Kenya prefer ultimately to self-administer a MAP.
In Uganda it's split between themselves and an HCP

Administration / administrator

% of women	Total	Ghana	Kenya	Uganda
Total Sample (n=)	927	315	303	309
I would administer it myself	49.1	81.1↑	36.4	27.9↓
A physician or nurse administers it the first time and then I would administer it to myself thereafter	16.4	4.2↓	36.0↑	10.3
A physician or nurse	16.0	2.5↓	12.9	33.1↑
My partner	5.6	8.1	3.0	5.5
A Community Healthcare Worker (CHW)	5.0	1.4	1.1	12.5↑
A CHW administers it the first time and then I would administer it to myself thereafter	2.6	0.4↓	2.7	4.8
A pharmacist	1.8	1.1	2.7	1.8
A pharmacist administers it the first time and then I would administer it to myself thereafter	1.5	-	3.8↑	0.7
A friend	1.2	1.1	1.1	1.5
A family member	0.5	0.4	-	1.1
Other	0.4	-	0.4	0.7

↓significantly lower than the 2 other countries

↑significantly higher than the 2 other countries



The context in which women live has important implications

THE WOMEN



PHOTO CREDIT: JEFF LUCAS, ROUTES2RESULTS IN SOUTH AFRICA

STRONG - UNDER PRESSURE - RECEPTIVE

THEIR ENVIRONMENT

Financial
limitations

Pressurised
environment

Privacy
challenges

THE OUTCOME

A contraceptive MAP has a high and broad level of appeal and perceived trial and a strong value proposition around important contraceptive needs: ease of use, convenience and discretion.

These are not mutually exclusive but interact with and support one another.

Qualitative and quantitative learnings

What people say about partnering with us

Collaborative

People based
Valuable network
Easy to work with

**Trustworthy,
Transparent,
Authentic &
Caring**

A true collaboration to work with R2R in understanding the market landscape for innovative health technologies.

Great experiences working with R2R to understand our users better and the potential market for new products. R2R are innovative, creative and very dedicated to understanding the lives of people we aim to serve.

Receptive to ideas, proffer creative suggestions to sticky issues, and produce high quality and relevant deliverables.

We admire the expertise of the R2R team as well as their commitment to providing quality deliverables at a very reasonable cost.

Fun
Passionate
Creative
Energy
Fearless

Thank you to all the women and healthcare providers who took part in this research, and to our partners and research teams.

We acknowledge Cardiff University, Georgia Institute of Technology, Jacob Coffey and Adam Wentworth whilst at Massachusetts Institute of Technology, and the late Prof Dr Rinti Banerjee and team at Indian Institute of Technology for discussions and for collaborating with the research.

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Please read more about this work in our publication in [Frontiers in Reproductive Health](#)

El-Sahn M, Elliott R, El-Sahn M, Lucas J and Wood Santos T (2024) End-user research into understanding perceptions of and reactions to a microarray patch (MAP) for contraception among women in Ghana, Kenya and Uganda. Front. Reprod. Health 6:1351692.

doi: 10.3389/frph.2024.1351692



Appendix



Notes



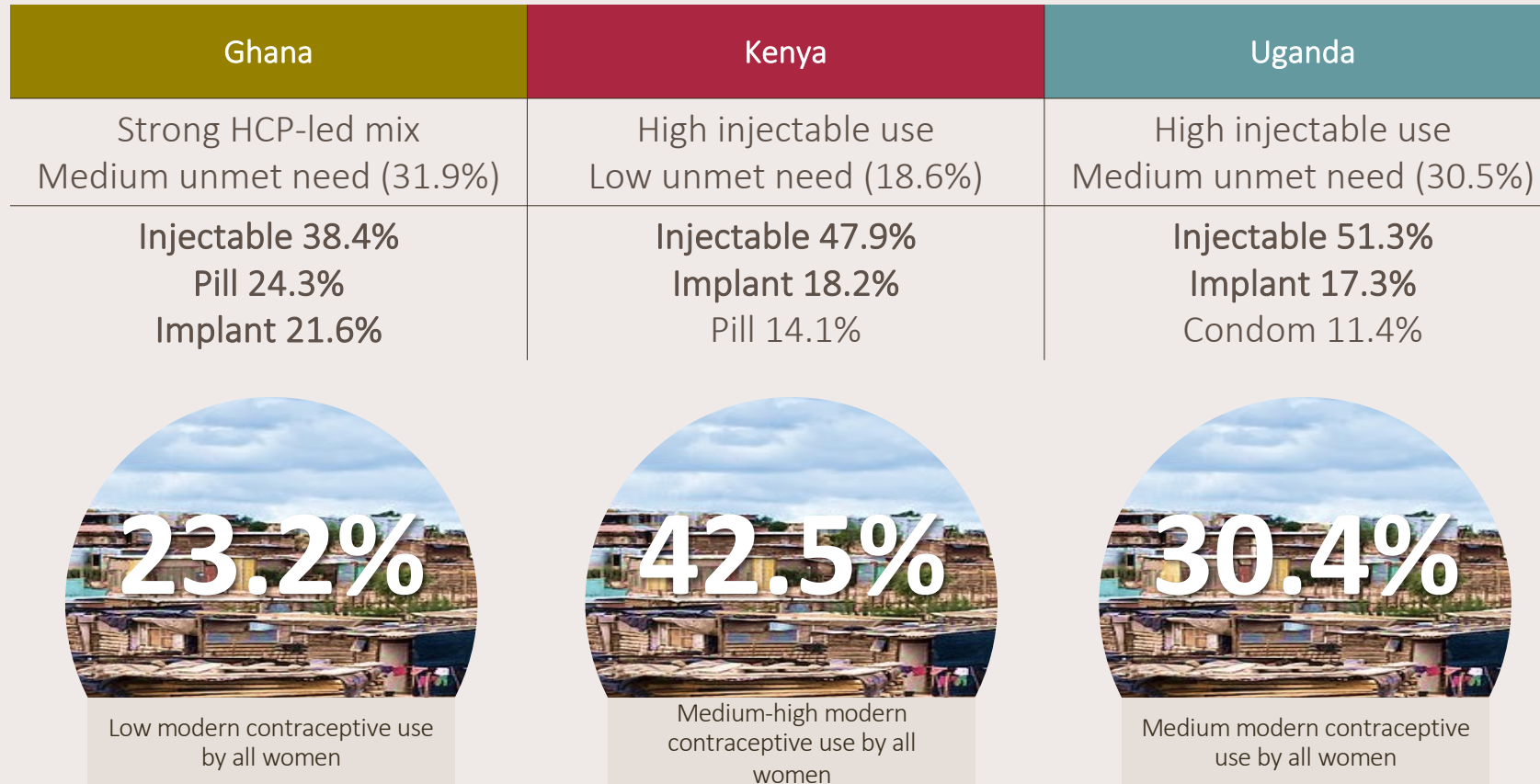
Notes for qualitative findings:

- We do not recommend drawing broad conclusions across country populations
- It is important to remember that sample size will fluctuate throughout because of the qualitative nature of this research: participants were free not to answer any question they did not want to

Notes for quantitative findings:

- Normally, mentions / answers which are under 3% are not shown on slides to ensure readability of graphic data representation
- Only significant differences are highlighted
- Only % above 3% shown on graphs
- All images except those owned by R2R or taken by R2R in field were sourced online. These photos (example above) were not purchased, and all images cannot be used outside of this presentation. Iconography from The Noun Project, and/or photo credits provided on images

~ We saw the value in conducting work which cross-cut East and West Africa, encompassed variety in need and MCPR, and wanted to check a hypothesis: if countries with strong injectable use are conducive for MAPs introduction*



The hypothesis included several untested ideas = a) countries where the primary modern contraceptive method is the injectable could mean end-users who are more familiar with the administration route, which can make the transition to a MAP more conceptually comfortable and b) injectable has a high discontinuation rate and a MAP could support continued contraceptive use. However, it is important to note b) could also lead to a negative perception of injectables and their potential side-effects and prior contraceptive use does not necessarily equate to willingness to try / appeal of another contraceptive method.

Sources: FP2030 and DHS data



We discussed MAPs with 1,062 women across three phases

1

Mini workshops, QuickFires + HCP immersions

5-hour face-to-face (F2F) mini workshop

Ghana (n=)	Kenya (n=)	Uganda (n=)
Women (25)	Women (25)	Women (25)
Total (n=75)		

Screening criteria: as phase 2

HCP immersions

	Ghana (n=)		Kenya (n=)		Uganda (n=)	
	Private	Public	Private	Public	Private	Public
Clinic Drs	3	3	3	3	3	3
Nurses	3	3	3	3	3	3
Pharmacist	2	-	2	-	2	-
CHW	-	2	-	2	-	2
Total	16		16		16	
Total (n=48)						

Screening criteria

- Practicing HCP of 1-40yrs
- Working in urban or peri-urban location
- Consult woman between 18-40yrs on contraception
- Consult at least 50 women per month generally and at least 10 per month specifically about contraception

2

Qualitative In-Depth Interviews

45-minute F2F discussions

Ghana (n=)	Kenya (n=)	Uganda (n=)
(20)	(20)	(20)
18-23 yrs. (6)	18-23 yrs. (6)	18-23 yrs. (6)
24-30 yrs. (6)	24-30 yrs. (6)	24-30 yrs. (6)
31-40 yrs. (8)	31-40 yrs. (8)	31-40 yrs. (8)
Total (n=60)		

Fieldwork locations

Abokobi, Juaben (Ghana)
Ndumberi, Muhoroni (Kenya)
Kiyindi, Masese (Uganda)

Screening criteria

- SEC C1-D
- Aged 18 - 40 years
- Self-report sexually active
- Not currently pregnant
- Not planning to conceive in next year
- Open to using contraceptives

3

Quantitative surveys

30-minute F2F with women, using mobile technology

Ghana (n=)	Kenya (n=)	Uganda (n=)
Women Total (315)	(303)	(309)
18-23 yrs. (28%)	(23%)	(21%)
24-30 yrs. (37%)	(39%)	(44%)
31-35 yrs. (18%)	(19%)	(18%)
36-48 yrs. (17%)	(19%)	(17%)
Total (n=927)		

Fieldwork locations

Accra, Kumasi, Takoradi, Abokobi, Juaben (Ghana)
Nairobi, Mombasa, Kisumu, Ndumberi, Ukunda, Muhoroni (Kenya)
Kampala, Jinja, Mbarara, Kyanja, Masese, Kiyindi (Uganda)

Screening criteria

- SEC C1-D
- Aged 18 - 49 years
- Self-report sexually active
- Not currently pregnant
- Not planning to conceive in next year
- Open to using contraceptives



We utilised visual stimuli including images, graphics, profiles and prototypes

The combination of stimuli presented depended on the research setting:

	Images + Graphics	Generic MAPs Profile	Prototype- Specific Profiles	Prototypes
Mini-Workshop	✓	✓	✓	✓
QuickFires	✓	✓	✓	✓
Provider Immersions	✓	✓	✗	✗
In-Depth Interviews	✓	✓	✗	✗
Quantitative Surveys	✓	✓	✗	✗

Due to intellectual property rights, we cannot share the images/descriptions used for the prototypes investigated in this work

And an end-user friendly generic MAP profile

The profile detailed information on the following areas – study participants read the profile alongside the moderators/interviewers who would check-in on understanding throughout

- **The microarray patch/ MAP is still in development and so does not have a brand name yet**
- **MAPs prevent pregnancy when it's used as recommended.**
- MAPs, consist of extremely small tips (not visible to the eye) that are inserted into the top layer of skin using a patch to deliver the contraceptive.
- It contains a low dose of contraceptive hormone that prevents women's ovaries from releasing eggs and helps block sperm from getting to the egg in the first place.
- It only needs to be applied on the skin once every 6 months to provide pregnancy protection for 6 months.
- It can be self-applied, applied by a healthcare provider, your partner, chosen family member or friend.
- You will be given initial training by your healthcare provider on how to apply the MAP. You can then show your chosen friend or family member how to apply the MAP to you, if you wish.
- **MAPs are highly effective**
- Other hormonal contraceptives like MAPs are approximately 99% effective if used as recommended.
- This means fewer than 1 in 100 women will experience an accidental pregnancy during the first year of use.
- If you use a MAP within the first 7 days after the start of your period, you are protected from pregnancy immediately. If you do not use a MAP within the first 7 days after the start of your period, you should use another form of contraceptive method for one week.
- MAPs does not prevent women from getting Sexually Transmitted Infections (STIs) or HIV. It cannot be used as an emergency contraceptive.
- **How do MAPs work?**
- The MAP is applied to your skin for a brief time (less than 5 minutes). It is applied either by a hand with some pressure or using an applicator.
- It can be applied on different areas of the body – you can choose.
- You could feel a sensation like either: bristles or prickles against your skin (which can be ignored) or scratches or pinching against your skin (which cannot be ignored).
- The application may cause some skin reaction/irritation that will go away within a few days.
- Successful application will be confirmed by either a noise like a clicking sound or colour change.
- If application is not successful, there won't be a clicking sound or colour change, don't worry the patch can be re-applied to a fresh part of the skin a second time, or if necessary, a new patch can be applied to a fresh part of the skin.
- MAPs inserts extremely small deposits under the skin that will continuously release contraceptive hormones into the body for 6 months.
- The deposits (tips) dissolve over time and are not harmful to your body.
- The contraceptive hormones remain in your system for 6 months after application and cannot be reversed for 6 months.
- **MAPs are safe**
- All non-pregnant women of reproductive-age (18-45) including adolescents, breastfeeding women, and HIV positive women, can use MAPs.
- If you happen to get pregnant, you should not apply another MAP (talk to your HCP).
- Don't worry, the baby will not be affected.
- **Periods/menstruation**
- When you are using MAPs, your menstrual bleeding may change and become absent, irregular, infrequent, frequent, prolonged, or rarely heavy. The bleeding changes that you experience during the first few months should settle into regular periods and more rarely, no periods.
- Changing bleeding patterns does not mean that MAPs does not suit you or is not giving you contraceptive protection. In general, you do not need to take any action. You should consult your doctor if menstrual bleeding is heavy or prolonged.
- **The positives**
- There are positive and negative things to say about each and every contraceptive method available. And everyone's different—so what one woman experiences may not be the same as what another woman experiences.
- It can be self-applied. It is easy to use. Convenient. Effective.
- It lasts 6 months. Long duration. Private and Discreet – You can choose whether you tell someone you are using the MAPs.
- It can be obtained from a pharmacy or drug shop.
- **Things you should know**
- Everyone worries about negative side effects, but for many women, they're not a problem.
- Most side effects are not harmful or dangerous.
- And if you do experience side effects, they'll probably go away.
- Remember, you're introducing something into your body, so it can take a few months to adjust. Give it time.
- Will probably go away: Irregular bleeding, mild skin reaction or irritation where applied.
- Less common: headache, breast tenderness, nausea/dizziness, vaginal discharge, abdominal pain – like period cramps.

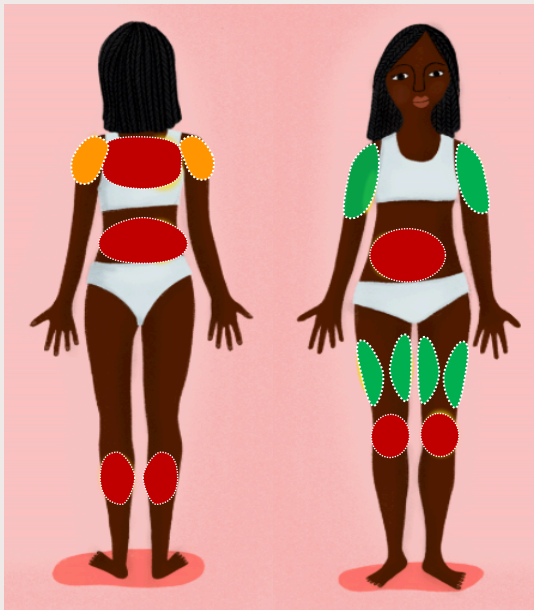


Areas of preferred application differ depending on who is applying MAP – more options for HCPs and partners

Where to apply MAP

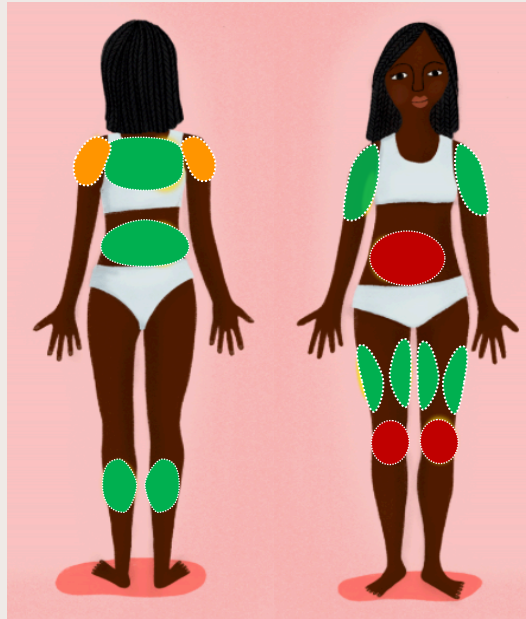
Self administration

Most preferred administration



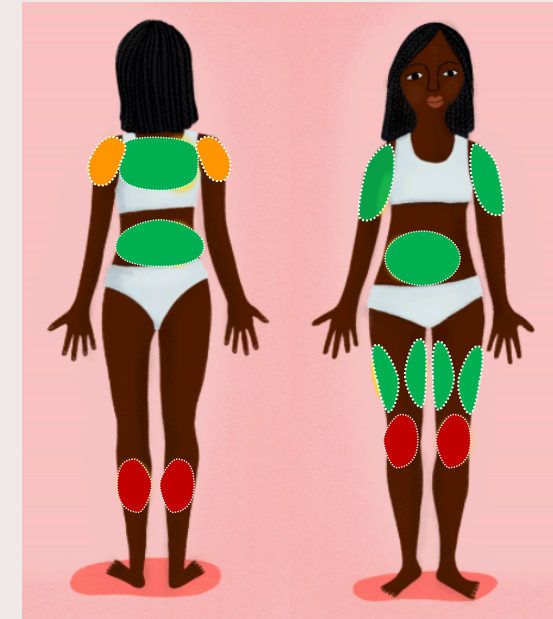
HCP

Preferred administration



Partner

Split preference, minority option





No menstruation at all is not acceptable to the majority.
Just over half of women find irregular periods unacceptable

	Total	Ghana	Kenya	Uganda
Total Sample (n=)	927	315	303	309
No monthly bleed / period at all				
Unacceptable	78.7	91.4↑	60.7↓	83.5
Acceptable	21.3	8.6	39.3↑	16.5
Irregular periods				
Unacceptable	52.0	45.4	51.2	59.5↑
Acceptable	48.0	54.6	48.4	40.5↓
↓significantly lower than the 2 other countries ↑significantly higher than the 2 other countries				

The potential menstrual side effects associated with the MAP as described in the CTPP included amenorrhea/no bleeding or irregular bleeding including infrequent, frequent, prolonged or heavy, but would likely resolve to regular periods or amenorrhea over time.

A significantly higher percentage of participants from Kenya perceived amenorrhea to be acceptable while a significantly higher percentage of participants from Ghana perceived it to be unacceptable. Study participants in Uganda found irregular bleeding to be significantly more unacceptable than in Ghana and Kenya.



Exercise explanation: understanding the trade-off between duration of pregnancy protection (PP) and potential return to personal natural level of fertility (RTF) with a short exercise

● Acceptability of duration of pregnancy protection (PP) + return to fertility time (RTF)

We asked women to compare duration sets of pregnancy protection (PP) and potential return to personal natural level of fertility (RTF)
We asked how acceptable the duration sets were and why

These are the duration sets discussed below:

	Duration of pregnancy protection (PP)	Potential return to personal natural level of fertility (RTF)
Option 1	6 months	12 months
Option 2	6 months	6 months
Option 3	3 months	6 months
Option 4	3 months	3 months
Option 5	1 month	3 months
Option 6	1 month	1 month



Broad acceptance to all PP and RTF duration sets (lower for most non-balanced sets). 6-month PP duration gets the largest share of preference, for 12 months then 6 months RTF. A third have no preference

Acceptable lengths of pregnancy protection (PP) and return to fertility (RTF)

% of Women finding method "acceptable"

Acceptable
Preferred

