

# BMJ Open

BMJ Open is committed to open peer review. As part of this commitment we make the peer review history of every article we publish publicly available.

When an article is published we post the peer reviewers' comments and the authors' responses online. We also post the versions of the paper that were used during peer review. These are the versions that the peer review comments apply to.

The versions of the paper that follow are the versions that were submitted during the peer review process. They are not the versions of record or the final published versions. They should not be cited or distributed as the published version of this manuscript.

BMJ Open is an open access journal and the full, final, typeset and author-corrected version of record of the manuscript is available on our site with no access controls, subscription charges or pay-per-view fees (<http://bmjopen.bmj.com>).

If you have any questions on BMJ Open's open peer review process please email [info.bmjopen@bmj.com](mailto:info.bmjopen@bmj.com)

# BMJ Open

## Country uptake of WHO recommendations on differentiated HIV testing services approaches: a global policy review

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2021-058098
Article Type:	Original research
Date Submitted by the Author:	19-Oct-2021
Complete List of Authors:	Kadye, Tafadzwa; UCL, Global Health Jamil, Muhammad; World Health Organization, Johnson, Cheryl; World Health Organization, Department of HIV/AIDS Baggaley, R; World Health Organization Barr-DiChiara, Magdalena; World Health Organization, Department of Global Programmes of HIV, Hepatitis and HIV Cambiano, Valentina; UCL
Keywords:	HIV & AIDS < INFECTIOUS DISEASES, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Public health < INFECTIOUS DISEASES

SCHOLARONE™  
Manuscripts



I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our [licence](#).

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which [Creative Commons](#) licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

1  
2  
3  
4  
5 **Target journal:** BMJ Open  
6  
7  
8  
9

10 **Title:** Country uptake of WHO recommendations on differentiated HIV testing services approaches:  
11 **a global policy review**  
12  
13

14  
15  
16 **Authors:** Tafadzwa Kadye<sup>1§</sup>, Muhammad S. Jamil<sup>2</sup>, Cheryl Johnson<sup>2</sup>, Rachel Baggaley<sup>2</sup>,  
17 Magdalena Barr-Dichiara<sup>2</sup>, Valentina Cambiano<sup>3</sup>  
18  
19

20  
21 **Affiliations:**  
22

- 23 1. Global HIV, Hepatitis and STIs Programme, World Health Organization, Geneva,  
24 Switzerland  
25
- 26 2. Institute for Global Health, University College London, London, UK  
27  
28  
29

30 <sup>§</sup> Corresponding author: Tafadzwa Kadye,  
31

32 Phone: 07392170704  
33

34 Email: tafadzwa.kadye.18@ucl.ac.uk  
35  
36  
37

38 TK: tafkadye@gmail.com  
39

40 MSJ: mjamil@who.int  
41

42 CJ: johnsonc@who.int  
43

44 RB: baggaleyr@who.int  
45

46 MBD: barrdichiam@who.int  
47

48 VC: v.cambiano@ucl.ac.uk  
49  
50

51 **Keywords:** HIV testing; HIV self-testing; community-based testing; partner services;  
52 differentiated service delivery; key populations ;  
53  
54

55  
56 **Word count :**

57  
58 **Abstract :297/300**

59  
60 **Main text : 3602/5000**

## Abstract

**Objectives** In 2015 and 2016 the World Health Organization (WHO) issued guidelines on HIV testing services (HTS) highlighting recommendations for a strategic mix of differentiated HTS approaches. The Policy review examines the uptake of differentiated HIV Testing service (HTS) approaches recommendations.

**Methods** Data were extracted from all available national policies published between January 2015 and June 2019 stored in WHO's national policy repository. WHO recommended as HTS approaches facility-based testing, community-based testing, HIV self-testing and provider-assisted referral (or assisted partner notification); in terms of testing components: pre-test information, lay provider testing and rapid testing. Descriptive analyses were conducted to examine availability of policies and adherence to WHO differentiated HTS recommendations.

**Results** Of 194 countries worldwide, 65 published policies identified in the review period. 24 were from from the African region (51% of African countries, 24/47), six the Eastern Mediterranean region (29%, 6/21), 21 the European region (40%, 21/53), five the American region (14%, 5/35), 4 the South East Asia region (36%, 4/11) and five the Western Pacific Region (19%, 5/27). Only five countries were compliant with recommendations and 63 included at least one. 85% (n=55) included facility-based testing for pregnant women, 75% (n=49) facility-based testing for key populations, 74% (n=48) community-based testing for key populations, 38% (n=25) HIV self-testing, 25% (n=16) provider-assisted referral, 69% (n=45) rapid testing, 57% (n=37) post-test counselling, 45% (n=29) lay provider testing and 29% (n=19) pre-test information. The highest uptake of WHO recommendations was seen in countries from the African and Eastern Mediterranean region.

**Conclusion** There was substantial variability in the uptake of WHO HTS recommendations, ranging from 25% to 85%. Uptake was above 50% for facility-based testing for pregnant women and key populations, community-based testing, rapid diagnostic testing and post-test counselling, uptake was between 25% and 45% for all the other recommendations.

### Strengths and limitations of this study

- A clear inclusion and exclusion criteria was provided through the use of the WHO HTS Guidelines
- Not all country policies worldwide were available within the WHO repository and therefore no information was extracted
- Not all country policies were provided in English, therefore policies were translated into English

For peer review only

1  
2  
3 644  
5 656  
7 668  
9 6710  
11 68 **Introduction**

12 69 HIV testing services (HTS) are essential in identifying individuals who are unaware of their  
13 70 HIV status, linking HIV positive individuals to treatment and HIV negative individuals to  
14 71 prevention services. In 2019 7.1 million people were estimated to be unaware of their HIV-  
15 72 positive status(1). Only six countries globally reported having reached the 90-90-90  
16 73 targets(2, 3).

17  
18 74

19 75 Testing uptake remains particularly low among key populations (defined as men who have  
20 76 sex with men (MSM), sex workers, people who inject drugs (PWID), people in prisons and  
21 77 closed settings and transgender people) making up nearly two-thirds (62%) of all new  
22 78 infections (4, 5). Men and young people also have low uptake and access to services (6-11) .  
23 79 In all populations with low uptake, particularly key populations, barriers to testing identified  
24 80 include stigma, discrimination. Structural barriers including accessibility of services,  
25 81 inconvenient clinic hours and opportunity costs for clients have also been identified  
26 82 amongst all populations (6-11).

27  
28 83

29 84 In 2015 the World Health Organization (WHO) published the consolidated guidelines on HIV  
30 85 testing services, followed by supplementary guidance recommending HIV self-testing  
31 86 (HIVST) and provider-assisted referral in 2016(5, 12, 13). Together, these guidelines  
32 87 encourage a strategic mix of differentiated HTS approaches for high and low HIV burden  
33 88 settings with a focus on priority populations and people with HIV who do not know their  
34 89 status (5, 14). This referred to a form of service delivery with approaches tailored to a  
35 90 population taking a 'client-centred approach', addressing barriers and reducing unnecessary  
36 91 burdens for healthcare systems(2). The guidelines outlined recommendations for several  
37 92 HTS approaches and HTS components with considerations regarding the population,  
38 93 epidemic and context. See supplementary information (additional file 1) for a summary of  
39 94 the 2015 and 2016 WHO guidelines on HIV testing services. In populations such as key

1  
2  
3 95 populations and adolescents where testing uptake remains low these services are essential  
4  
5 96 in reducing barriers to testing reach those who would otherwise not get tested, and a  
6  
7 97 feasible and acceptable practice in many settings (6-11).  
8  
9 98

## 10 99 **2019 HTS guidelines update**

11  
12 100 In 2019 the WHO published updated consolidated guidelines for HIV testing(14). These  
13  
14 101 guidelines included a new conditional recommendation on social network-based  
15  
16 102 approaches for HIV testing and updated recommendations for HIVST and counselling  
17  
18 103 messages(14, 15). In these new guidelines generalized and concentrated epidemic  
19  
20 104 classification is no longer used due to changing epidemics, instead countries as referred to  
21  
22 105 as high or low burden depending on their epidemic (14). However, as this review relates to  
23  
24 106 uptake of 2015 HTS guidelines, countries have been classified as having either a generalized  
25  
26 107 or concentrated epidemic to ensure consistency with language used in these guidelines.  
27  
28 108

29 109 It is important to monitor the uptake of the WHO HTS guidelines into country policies and  
30  
31 110 understand country needs to support inclusion of WHO recommendations in them.  
32  
33 111 However, we recognize that HTS policy uptake is often not reflective of implementation and  
34  
35 112 further research is needed to address this gap. To this end we reviewed national HTS  
36  
37 113 policies to examine the uptake of WHO HTS recommendations on differentiated testing  
38  
39 114 services.  
40  
41 115

## 42 116 **Methods**

43  
44 117 The study included No patient involved.  
45  
46 118

### 47 119 **Search strategy**

48  
49 120  
50  
51 121 A comprehensive search of national HTS policy documents was undertaken using the [WHO](#)  
52  
53 122 [national policy repository](#) (16). The repository was first produced in 2015 and is routinely  
54  
55 123 updated by WHO staff using a google search and search of the Ministry of Health websites.  
56  
57 124 The repository included policies relating to HIV testing services, HIV counselling services,  
58  
59 125 prevention services, antiretroviral therapy (ART), as well as policies relating to prevention of  
60  
126 mother-to-child transmission, HIV partner services, national HTS action/strategic plans, and



1  
2  
3 127 differentiated service delivery. In addition, national policies relating to sexual health, and  
4  
5 128 sexually transmitted infections were also included.

6  
7 129  
8  
9 130 For inclusion, policies needed to report on national HIV testing strategies and be published  
10  
11 131 between January 2015 and June 2019. The most recent policy document containing  
12  
13 132 information on HTS was used for extraction.

14 133  
15  
16 134 The 2015 cut-off was chosen as it represents the year when first WHO consolidated  
17  
18 135 guidelines on HIV testing services were published. Policies in languages other than English  
19  
20 136 were translated using google translate. Those that google was unable to translate were  
21  
22 137 excluded. Please see further details on the process to identify country policies including HTS  
23  
24 138 recommendations in Figure 1.

25 139

#### 26 140 **Data extraction**

27  
28  
29 141 Data was extracted by one author (TK) and it included for HTS approaches: (1) Facility-based  
30  
31 142 testing for pregnant women (1a), adolescents (1b), infants and children (1c), and key  
32  
33 143 populations (1c); (2) Community-based testing; (3) HIV self-testing and (4) Provider-assisted  
34  
35 144 referral. For HTS components: (5) Pre-test information/counselling, (6) Post-test counselling,  
36  
37 145 (7) lay provider testing and (8) rapid testing. In the 2015 guidelines pre-test information was  
38  
39 146 recommended instead of pre-test counselling, however data for pre-test counselling was  
40  
41 147 extracted to better understand if countries were still recommending this component. Of  
42  
43 148 note HIV testing recommendations on facility-based testing were population-specific.

44 149

#### 45 150 **Data analysis and reporting**

46 151

47  
48  
49 152 First, we estimated the number and proportion of countries in each WHO region that had a  
50  
51 153 relevant policy in the period of interest. Secondly, we determine the proportion of countries  
52  
53 154 that included the WHO HTS recommendations in their policies. This was done overall  
54  
55 155 (worldwide) and stratified by WHO region and epidemic type (concentrated or generalized).  
56  
57 156 This last stratification was required given some recommendations were epidemic type  
58  
59 157 specific: in particular facility-based testing for those with signs and symptoms, adults,  
60

1  
2  
3 158 adolescents and children apply only to concentrated epidemics and community-based  
4  
5 159 testing only to concentrated and generalised epidemics .  
6

7 160 Policies were categorised in three groups:

- 8  
9 161 • Compliant: Policies that clearly and explicitly stated and included a specific  
10 162 recommendation  
11  
12 163 • Not compliant: Policies that did not include a specific recommendation  
13  
14 164 • Unclear: Policies in which compliance with WHO recommendations was unclear due  
15 165 to insufficient information.  
16  
17

18 166 Analyses were conducted in Microsoft Excel. Data were also stratified and analysed  
19 167 according to epidemic type defined by high ( $\geq 5\%$ ) and low ( $< 5\%$ ) HIV burden.  
20  
21  
22 168

## 23 169 **Results**

### 24 170 **Characteristics of included policies**

25 171  
26 172 Of 194 WHO member states 148 countries had at least one policy within the WHO national  
27 173 policy repository. 82 were excluded as they were published before January 2015 and one  
28 174 because it was written in Arabic and Google was unable to translate it. 65 policies were  
29 175 included as they were published between January 2015 and June 2019 and were in English  
30 176 or could be translated (see Figure 1); Of these 65, 30 were HIV testing policies, 12 integrated  
31 177 guidelines for HTS, 15 national strategic plans for HIV testing services while eight were  
32 178 related polices reporting on HIV testing (one HIV counselling policies, one ART policy, one  
33 179 integrated guidelines for STIs, one sexual health national strategic plan, one policy on HIV  
34 180 contact management, one global AIDS progress report, one differentiated testing guideline  
35 181 and one policy on community-based testing). 34(52%) country policies were in English. Cote  
36 182 d'Ivoire and Morocco latest policies (written in French and Arabic) gave policy documents in  
37 183 formats that did not permit translation. For Cote d'Ivoire there was an earlier policy  
38 184 published in 2016 and so we used that one. No other policies were available for Morocco in  
39 185 the timeframe of interest; therefore, we could not include Morocco.  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57

58 188 *Figure 1.* Process to identify country policies including recommendations on HIV testing services.  
59  
60 189

1  
2  
3 190 Figure 2 illustrates the 65 countries with a policy on HIV testing that we have identified. Of  
4  
5 191 the 65 country policies, 24 were from the WHO Africa region (AFR) corresponding to 51% of  
6  
7 192 African countries (24/47), six from the WHO Eastern Mediterranean region (EMR; 29% of 21  
8  
9 193 countries), 21 from the WHO European region (EUR; 40% of 53 countries), five from the Pan  
10  
11 194 American region (AMR; 14% of 35 countries), four from the WHO South East Asia Region  
12  
13 195 (SEAR; 36% of 11 countries) and five from the Western Pacific Region (WPR; 19% of 27  
14  
15 196 countries). 37% (24/65) were classified as having a concentrated epidemic, 34% (22/65) a  
16  
17 197 generalised epidemic and the remaining 29% (19/65) as having a low level epidemic.

18 198  
19 199  
20 200  
21 201 *Figure 2. Countries with a national policy identified between January 2015 and June 2019.* A map of all 65  
22 202 countries within this review (n=65). Countries highlighted in orange are those that included all  
23 203 recommendations relevant to their country setting (n=5).  
24 204

### 25 205 **Overall uptake of policies**

26 206 Five countries provided policies that were complaint with all the relevant recommendations  
27 207 (see Figure 2). Figure 3a illustrates the number of countries that included the  
28 208 recommendations which apply to all setting and that are not specific to sub-populations, as  
29 209 well as pre-test counselling; while, figure 3b shows the number of countries that included  
30 210 recommendations specific for some sub-populations (on the left) or that apply only to  
31 211 certain epidemics (on the right). Among recommendations on HTS approach and  
32 212 components applicable to all settings and populations (Figure 3a): provider-assisted referral  
33 213 had the lowest uptake at 25% (16/65), 38% (25/65) of countries recommended HIVST, 69%  
34 214 (45/65) of rapid testing, 45% (29/65) permitted lay provider testing, 29% (19/65)  
35 215 recommended pre-test information, 35% (23/65) recommended pre-test counselling (or  
36 216 who did not specify the use of pre-test information were not included) and 35% (37/65)  
37 217 post-test counselling.

38 218  
39 219 Regarding recommendation for specific sub-populations (Figure 3b on the left), 65% (42/65)  
40 220 of countries recommended facility-based testing for infants and children, 85% (55/65) for  
41 221 pregnant women, 75% (49/65) for key populations and 74% (48/65) recommended  
42 222 community-based testing for key populations. Of countries with a concentrated epidemic  
43 223 (n=24), 71% (17/24) recommended facility-based testing for all those presenting with signs

1  
2  
3 224 and symptoms. Of those with a generalised epidemic (n=22), 86% (19/22) recommended  
4  
5 225 facility-based testing for adolescents.  
6  
7 226  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

For peer review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244

**Figure 3a. Number of countries that included recommendations valid in all settings and populations from the 2015 WHO consolidated guidelines for HTS, by type of recommendation and WHO region.**

AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region.

**Figure 3b. Number of countries included in the review that included population or epidemic specific recommendations from the 2015 WHO consolidated guidelines for HTS, by type of recommendation and WHO region**

AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region;  
Facility-based testing for key populations here refers to provider-initiated testing and counselling this is recommended in malnutrition clinics or sexually transmitted infections (STI) or hepatitis and Tuberculosis services or health services for key populations in all settings. Facility-based testing for pregnant women, infants and children applies to all countries (n=65). Community-based testing for key populations applies to all countries (n=65).  
Facility-based testing for all those presenting with signs and symptoms is recommended only in countries with a concentrated epidemic (n=24); facility-based testing for adolescents only in countries with a generalised epidemics (n=22).

For peer review only

#### 246 **Variation in uptake of HTS approaches recommended for all countries across WHO regions**

247 The uptake of recommendations varied substantially across countries (see uptake of single  
 248 recommendations for each country in additional file 2) and regions. HIVST was  
 249 recommended by 38% (25/65) of countries. The regions with the highest uptake of HIVST  
 250 were the EMR (67%; 4/6) and the AFR (54%; 13/24), followed by the WPR (40%; 2/5) and  
 251 EUR (29%; 6/21). No countries from SEAR and AMR included recommendations for HIVST.  
 252 Only 25% (13/65) of countries included recommendations for provider-assisted referral:  
 253 38% of AFR (9/24) countries, 33% of EMR (2/6), 10% OF (2/21) in EUR, 20%((1/5) of AMR,  
 254 5% in the SEAR (1/4) and in WPR (1/5).

#### 256 **Variation in uptake of HTS components (Pre-test Information, Post-test Counselling, lay 257 provider testing, Rapid testing) recommended across WHO regions**

258 Pre-test information was included in 29% (19/65) of country policies. Countries within the  
 259 EMR showed the highest uptake(83%; 5/6), followed by the AFR (42%; 10/24), WPR (20%;  
 260 1/5), SEAR (25%; 1/4) and EUR (10%; 2/21). No countries from AMR included this  
 261 recommendation. 57% (37/65) of countries recommended post-test counselling, with  
 262 variation across regions (100% EMR, 88% AFR, 40% WPR, 25% AMR, 25% SEAR, and 19%  
 263 EUR). Whilst pre-test counselling is no longer recommended by WHO, it was still included by  
 264 35% (23/65) of countries: (60% AMR, 58% AFR, 50% SEAR, 33% EMR and 10% EUR) while no  
 265 countries in the WPR. Rapid testing was included in 69% (45/65) of country policies, with  
 266 regional variation (100% EMR, 88% AFR, 80% WPR, 50% SEAR, 48% EUR and 40% AMR).  
 267 Lay provider testing was permitted in 45% (29/65) of countries (75% AFR, 67% EMR, 50%  
 268 SEAR, 40% WPR, 20% AMR, and 5% EUR).

270

271

272 *Figure 4. Number of countries including the new recommendations, by year.*

273

274 Lay Provider testing was recommended for the first time by WHO in 2015 and provider-  
 275 assisted referral and HIVST in 2016. Figure 4 shows the number of countries including the  
 276 new recommendations in their policies in the years following their introduction. A steep

277 increase in uptake can be observed with 16, 25 and 29 countries including recommendation  
278 on respectively provider-assisted referral, HIVST and lay provider testing by June 2019.

279

280

281 **Variation in uptake of population specific HTS approaches recommended for all countries**  
282 **across WHO regions**

283 Facility-based testing for pregnant women was recommended by 85% (55/65) of countries,  
284 including all countries in EMR (100%; 6/6) and AFR (100%; 24/24) followed by WPR (80%;  
285 4/5), EUR (76%; 16/21), AMR (60%;3/5) and SEAR (50%;2/4). 65%(42/65) recommended  
286 facility-based testing for infants and children (100% EMR, 76% AFR, 80% WPR, 75% SEAR,  
287 40% AMR and 19% EUR).

288

289 Facility-based testing for key populations is recommended in 49 countries (100% EMR, 88%  
290 AFR, 67% EUR, 60% AMR, 60% WPR and 50% SEAR): 69% (34/49) recommended targeted  
291 testing for MSM, 59% (29/49) for sex workers or those who engage in transactional sex, 45%  
292 (22/49) for prisoners, 18% (9/49) for transgender people and 57% (28/49) for PWID . High  
293 uptake was observed in countries from the EMR, with a 100% (6/6) uptake, as well as AFR  
294 (88%; 21/24), the EUR (66%;14/21) and WPR (60%; 3/5), while it was lower in the AMR  
295 (60%; 3/5) and the SEAR (50%; 2/4). 74%(48/65) of countries recommended community-  
296 based testing for key-populations. Of the countries that included community-based testing  
297 for key populations; 13% (6/48) recommended testing in community health centres, 44%  
298 (21/48) home-based/door-door testing, 35% (17/48) workplace testing, 23% (11/48) testing  
299 within educational establishments, 15% (7/48) testing in places of worship. 38% (18/48)  
300 included outreach services and 35% (17/48) mobile testing. Uptake varied by region (100%  
301 EMR, 88% AFRR, 80% WPR, 52% EUR, 50% SEAR and 20% AMR).

302

303 **Variation in uptake of epidemic specific HTS approaches recommended across WHO**  
304 **regions**

305 37% (n=24) of countries had a concentrated epidemic. 20% (5/24) were in the AFR region,  
306 46% (11/24) in EURO, 12% (3/24) in AMR, 8% (2/24) in SEAR, 8% (2/24) in WPR and 4%  
307 (1/24) in EMR. 72% (18/24) of countries with a concentrated epidemic recommended  
308 facility-based testing for all those presenting with signs and symptoms. 34% (n=22) of

1  
2  
3 309 countries had a generalised epidemic. Amongst the countries with a generalised epidemic  
4  
5 310 100% (22/22) recommended facility-based testing for adolescents.  
6  
7 311  
8  
9 312

## 11 313 **Discussion**

12  
13 314 Across all country policies reviewed, only five countries (in AFR, EMR and EUR) included all  
14  
15 315 the WHO HTS recommendations (relevant to their country setting). However, this suggests  
16  
17 316 that it is feasible to adapt latest policies within a short time frame. We found high uptake of  
18  
19 317 recommendations for community-based testing, first recommended in 2013 (17). The  
20  
21 318 uptake of recommendations first issued in 2016 (HIVST and provider-assisted referral) was  
22  
23 319 low, with less than half of countries recommending both. This may be due to their later  
24  
25 320 introduction to recommendations; although the uptake was increasing steadily. Population  
26  
27 321 specific facility-based testing recommendations were generally taken up for pregnant  
28  
29 322 women and, infants and children and key populations although very few policies included  
30  
31 323 transgender populations. Among countries with generalised and concentrated epidemics,  
32  
33 324 there was high uptake of community-based testing for key populations; while, only half of  
34  
35 325 countries recommended mobile testing explicitly, and just over two fifths recommended  
36  
37 326 outreach testing. These methods are likely to increase the uptake of HIV testing for key  
38  
39 327 populations, by reducing stigma and discrimination.  
40  
41 328

42 329 As of 2019, 81% of all people with HIV are estimated to have been diagnosed globally(18).  
43  
44 330 Differentiated testing approaches are critical for reaching the remaining people with HIV as  
45  
46 331 standard testing services have not been successful in serving them. WHO recommends a  
47  
48 332 strategic mix of HTS depending on the epidemiology, context and focus populations. In high  
49  
50 333 HIV burden settings in Africa, men, adolescents, young people and key populations are more  
51  
52 334 likely to be undiagnosed. In other countries, key populations and their partners are the most  
53  
54 335 affected populations, testing services need to be focused on them. National policies often  
55  
56 336 did not elaborate how various approaches will be used within a differentiated HTS plan to  
57  
58 337 reach national goals and specific service delivery models and support tools. Moreover,  
59  
60 338 inclusion of recommendations in policies not always directly lead to implementation or scale



1  
2  
3 339 up of effective practices. Further monitoring is needed to understand the implementation  
4  
5 340 status of services as well as their scale and coverage.  
6

7 341  
8  
9 342 HIVST and provider assisted referral had lower uptake despite both these having been  
10  
11 343 found to be acceptable and feasible to implement and effective in reaching people who  
12  
13 344 would not otherwise have tested for HIV(19, 20). Despite steady increase in the number of  
14  
15 345 countries adopting these recommendations within national policies, few countries overall  
16  
17 346 had national policies supporting them, particularly for provider-assisted referral. According  
18  
19 347 to latest Global AIDS Monitoring, as of July 2020 88 countries globally report inclusion of  
20  
21 348 HIVST in national policies and nearly half of them (41, 47%) are routinely implementing  
22  
23 349 HIVST(18).  
24

25 350  
25 351 Since 2015, WHO recommends brief pre-test information when offering HTS. Evidence and  
26  
27 352 programmatic experiences suggest lengthy pre-test counselling is no longer needed and  
28  
29 353 may in fact deter some testers from seeking HTS, such as repeat testers. Our review shows  
30  
31 354 many countries are still continuing with traditional pre-test counselling which reduces the  
32  
33 355 efficiency of HTS and does not represent the best use of scarce human and financial  
34  
35 356 resources. Also, anecdotal evidence suggests many countries provide post-test counselling  
36  
37 357 that includes outdated information. For example, many programmes have not adapted  
38  
39 358 counselling messages to include information of prevention benefits of treatment and  
40  
41 359 achieving viral suppression for partners (undetectable=untransmissible or U=U), availability  
42  
43 360 of effective prevention options such as pre-exposure prophylaxis (PrEP) and messages on  
44  
45 361 optimal testing frequency based on risk and epidemiology. Countries need to review and  
46  
47 362 revise their policies to adapt latest WHO recommendation on pre-test information and post-  
48  
49 363 test counselling.  
50

51 364  
51 365 Majority of countries (over two thirds) included in this review support the use of rapid HIV  
52  
53 366 testing, which can provide same day diagnosis facilitating rapid initiation of ART. WHO  
54  
55 367 recommends the use of trained lay providers and peers for delivering HTS using RDTs.  
56  
57 368 However, few countries with RDT policy supported the use of lay providers. This can affect  
58  
59 369 expansion of services to offer testing at places accessible and convenient to populations  
60  
370 groups most affected with HIV including introduction and scale up of community-based

1  
2  
3 371 testing. Countries need to review their policies to address legal barriers to use of trained lay  
4  
5 372 providers and develop standard operating procedures and training material and supervision  
6  
7 373 activities for this cadre of providers.  
8

9 374

10 375 Our review found variations in policy uptake by region. Overall countries in EMR region  
11  
12 376 showed the highest uptake followed by AFR countries, while countries within AMR showed  
13  
14 377 to have the lowest uptake of recommendations. Countries within SEAR, EUR and WPR also  
15  
16 378 showed a lower uptake. These findings need to be interpreted with caution as we identified  
17  
18 379 a small number of policies from regions other than AFR and thus may not be representative  
19  
20 380 of overall situation in the regions. It is encouraging that the uptake of WHO policies was  
21  
22 381 high in AFR given the countries in this region represent the highest burden of both  
23  
24 382 diagnosed and undiagnosed HIV infection(1).  
25

26 383

27 384 Overall, our review findings indicate that many countries would need ongoing support in  
28  
29 385 order to include the latest WHO recommendations on HTS in their policies. All stakeholders  
30  
31 386 including international organizations, implementing partners, and donors need to support  
32  
33 387 the governments and national programmes in updating national policies. Community groups  
34  
35 388 and civil society need to advocate for availability of latest and evidence-based  
36  
37 389 recommendations and interventions in their countries. Further support will be needed in  
38  
39 390 operationalization and scale up of such policies, and strategies focusing on key populations  
40  
41 391 are required in some settings. Regular and close monitoring of country policy uptake and  
42  
43 392 implementation status is needed to identify country support needs for appropriate action.  
44

45 393

46 394 This review has several limitations. National HTS policies were available only for 65  
47  
48 395 countries that published them between January 2015 and June 2019. There may be other  
49  
50 396 policies published in this period that we may not have identified if not publicly available. For  
51  
52 397 eight countries information was extracted from policy documents that were not directly  
53  
54 398 related to HTS and may not have information with required level of detail. For the EMR,  
55  
56 399 SEAR and WPR regions national policies were available from only a small number of  
57  
58 400 countries and thus they may not be representative of the situation in the whole regions.  
59

60 401

## 402 **Conclusion**

403  
404 This review found that the uptake of all WHO's 2015 and 2016 HIV testing recommendations  
405 varied substantially. Only five countries included all the recommendations relevant to their  
406 country setting. Uptake was particularly low for HIV self-testing, provider-assisted referral  
407 and lay provider testing, key interventions for reaching undiagnosed populations and for  
408 expanding access to HTS. This requires attention. Encouragingly the uptake of  
409 recommendations in the AFR region, the region with greatest HIV burden, was high  
410 compared to other regions. Differentiated HIV testing services are essential for reaching  
411 people with HIV who do not know their status and others at high ongoing risk to facilitate  
412 linkage to prevention, treatment and care. Global efforts are needed to support countries to  
413 accelerate adoption and implementation of the full WHO HIV testing guidelines.

414

415

416

417

418

419

420

421

422

423

424

## 425 **Funding statement**

426 This research received no specific grant from any funding agency in the public, commercial  
427 or not-for-profit sectors

428

429

## 430 **Competing interests**

431 None of the authors has competing interest to declare

432

1  
2  
3 433 **Authors Contributions**

4  
5 434 TK reviewed and extracted guidelines. MS, CJ, MD and VC provided substantial input and  
6  
7 435 edits to the manuscript.  
8

9 436

10  
11 437 **Author information**

12  
13 438 Cheryl Johnson contributed to the writing, coordination and research for the WHO  
14  
15 439 Consolidated Guidelines for HIV Testing Services.  
16

17 440

18  
19 441 **Acknowledgements**

20  
21 442

22 443 Funding: No funding sources

23  
24 444 Disclaimer:  
25

26 445

27  
28 446 **Additional Files**

29  
30 447

31  
32 448 **Additional file 1: WHO guidelines for differentiated HIV testing services**

33 449 A summary of the 2015 and 2016 Consolidated Guidelines on HIV testing recommendations.  
34

35 450

36  
37 451 **Additional file 2: Extraction tool**

38 452 Document containing extraction tool use to collect data. The document contained the  
39  
40 453 extraction tool used to extract data. This included all countries, regions, policy document  
41  
42 454 type, date of policy and indication of the uptake of recommendations. The document contains  
43  
44 455 further information on key findings and countries by epidemic type.  
45

46 456

47  
48 457

49 458

50  
51 459

52  
53 460

54  
55 461

56  
57 462  
58  
59  
60

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

463 **List of Abbreviations**

464

465 ART – Antiretroviral Therapy , aPN – assisted Partner Notification, DSD – Differentiated  
466 Service Delivery , HIV – Human Immunodeficiency Virus , HIVST – HIV self-testing , HTS – HIV  
467 testing services , MSM – Men Who Have Sex with Men , NSP – National Strategic Plans , PITC  
468 – Provider- initiated Testing and Counselling , SW – Sex Workers , TB – Tuberculosis , TG –  
469 Transgender , WHO – The World Health Organisation.

470

For peer review only

## References

1. Fact Sheet: Global AIDS update 2020 [Internet]. 2020 [cited 24th July 2019]. Available from: [https://www.unaids.org/sites/default/files/media\\_asset/UNAIDS\\_FactSheet\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf).
2. IAS. Differentiated service delivery for HIV: A decision Framework for HIV testing services. It's time to test differently. Geneva, Switzerland: International Aids Society; 2018. p. 1-68.
3. 90-90-90: Treatment for All [Internet]. UNAIDS. 2019 [cited 15th May 2019]. Available from: <https://www.unaids.org/en/resources/909090>.
4. WHO. Progress report on HIV, viral hepatitis and sexually transmitted infections, 2019 Accountability for the global health sector strategies, 2016–2021. Geneva, Switzerland: WHO; 2019.
5. WHO. Consolidated guidelines on HIV testing services. Geneva: WHO; 2015. p. 1-188.
6. Qiao S, Zhang Y, Li X, Menon J, Anitha. Facilitators and barriers for HIV-testing in Zambia: A systematic review of multi-level factors. PLoS ONE. 2018;13(2):e0192327.
7. Huong NTT, Hau NT, Chau NV, Tan LT, Tam NTM, Gray R, et al. Perceived barriers and facilitators to uptake of HIV testing services among people who inject drugs in Vietnam. Journal of Substance Use. 2018;23(6):551-6.
8. Surratt HL, O'Grady CL, Kurtz SP, Buttram ME, Levi-Minzi MA. HIV Testing and Engagement in Care among Highly Vulnerable Female Sex Workers: Implications for Treatment as Prevention Models. Journal of Health Care for the Poor and Underserved. 2014;25(3):1360-78.
9. Staveteig SSWHKS, S.E.K Nybro, E. Demographic patterns of HIV Testing Uptake in Sub-Saharan Africa. Calverton, Maryland, USA: ICF International; 2013.
10. Traversy GP, Austin T, Timmerman K, Gale-Rowe M. An overview of recent evidence on barriers and facilitators to HIV testing. Canada Communicable Disease Report. 2015;41(12):302-21.

- 1  
2  
3 495 11. Loos J, Manirankunda L, Hendrickx K, Remmen R, Nöstlinger C. HIV Testing in Primary Care:  
4  
5 496 Feasibility and Acceptability of Provider initiated HIV Testing and Counseling for Sub-Saharan African  
6  
7 497 Migrants. *AIDS Education and Prevention*. 2014;26(1):81-93.  
8  
9  
10 498 12. WHO. WHO recommends HIV testing by Lay Providers. Geneva: WHO; 2015.  
11  
12 499 13. WHO. Guidelines on HIV Self-testing and Partner notification: supplement to consolidated  
13  
14 500 guidelines on HIV testing services. Geneva, Switzerland: WHO; 2016.  
15  
16 501 14. WHO. Consolidated guidelines on HIV testing services for a changing epidemic. Geneva,  
17  
18 502 Switzerland: WHO; 2019.  
19  
20 503 15. WHO. WHO recommends social-network based HIV testing approaches for key populations  
21  
22 504 as part of partner services package. Geneva, Switzerland; 2019.  
23  
24 505 16. WHO national policy repository [Internet]. WHO. 2020 [cited 21st February 2021]. Available  
25  
26 506 from: <https://www.dropbox.com/sh/inrnvpkk3dd5lgq/AAAASPIqEFfjuaPOXSV6iC9Ea?dl=0>.  
27  
28  
29 507 17. WHO. *Consolidated ARV guidelines*. Geneva, Switzerland: WHO; 2013.  
30  
31 508 18. UNAIDS. Indicators for monitoring the 2016 Political Declaration on Ending AIDS. UNAIDS;  
32  
33 509 2020.  
34  
35 510 19. Zhang C, Xianhong L, Brecht M-L, Koniak-Griffin D. Can self-testing increase HIV testing  
36  
37 511 among men who have sex with men: A systematic review and meta-analysis. *PLoS ONE*.  
38  
39 512 2017;12(11):e0188890.  
40  
41 513 20. Qin Y, Han L, Babbitt A, Walker JS, Liu F, Thirumurthy H, et al. Experiences using and  
42  
43 514 organizing HIV self-testing. *Aids*. 2018 Jan 28;32(3):371-81. PubMed PMID: 29194120. PMCID:  
44  
45 515 PMC5758403. Epub 2017/12/02. eng.  
46  
47  
48  
49  
50  
51 516  
52  
53  
54  
55  
56  
57  
58  
59  
60

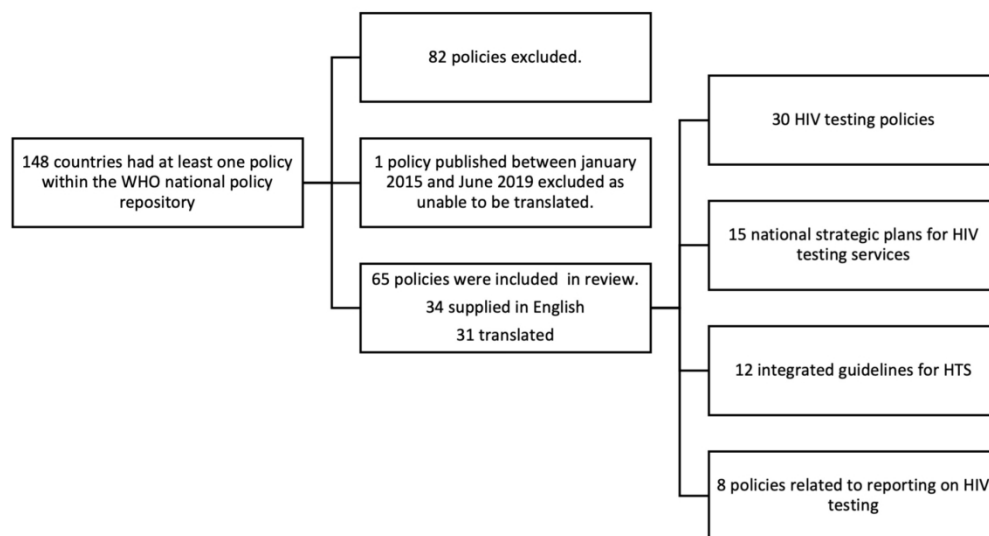


Figure 1. Process to identify country policies including recommendations on HIV testing services.

174x116mm (300 x 300 DPI)



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

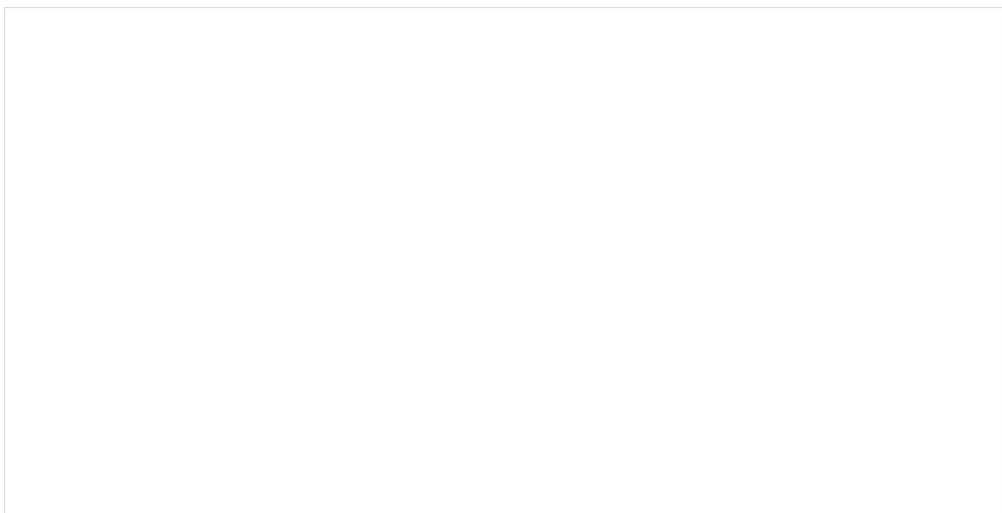


Figure 2. Countries with a national policy identified between January 2015 and June 2019. A map of all 65 countries within this review (n=65). Countries highlighted in orange are those that included all recommendations relevant to their country setting (n=5).

160x82mm (300 x 300 DPI)

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

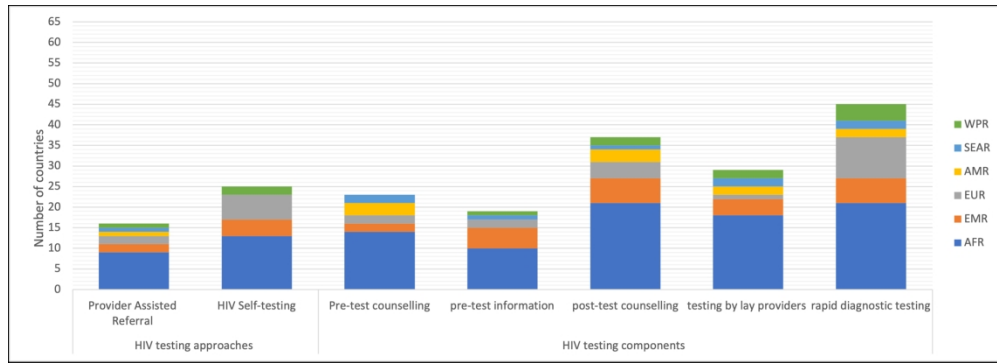


Figure 3a. Number of countries that included recommendations valid in all settings and populations from the 2015 WHO consolidated guidelines for HTS, by type of recommendation and WHO region.

AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region.

251x90mm (300 x 300 DPI)

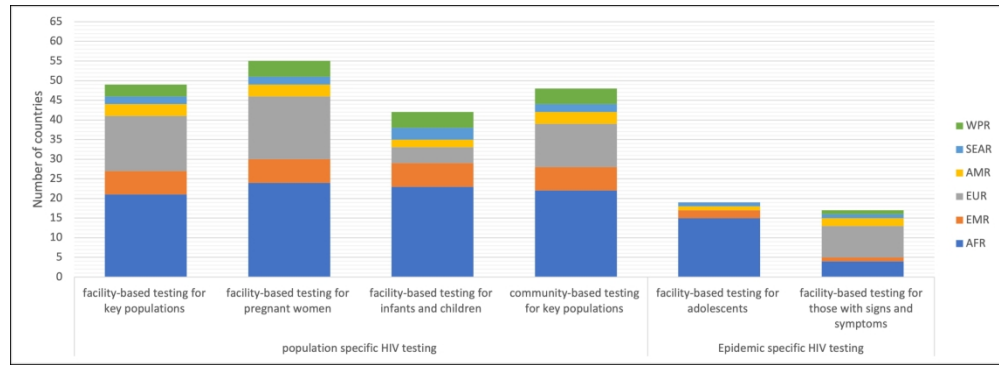


Figure 3b. Number of countries included in the review that included population or epidemic specific recommendations from the 2015 WHO consolidated guidelines for HTS, by type of recommendation and WHO region

AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region;

Facility-based testing for key populations here refers to provider-initiated testing and counselling this is recommended in malnutrition clinics or sexually transmitted infections (STI) or hepatitis and Tuberculosis services or health services for key populations in all settings. Facility-based testing for pregnant women, infants and children applies to all countries (n=65). Community-based testing for key populations applies to all countries (n=65).

Facility-based testing for all those presenting with signs and symptoms is recommended only in countries with a concentrated epidemic (n=24); facility-based testing for adolescents only in countries with a generalised epidemics (n=22).

253x91mm (300 x 300 DPI)

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

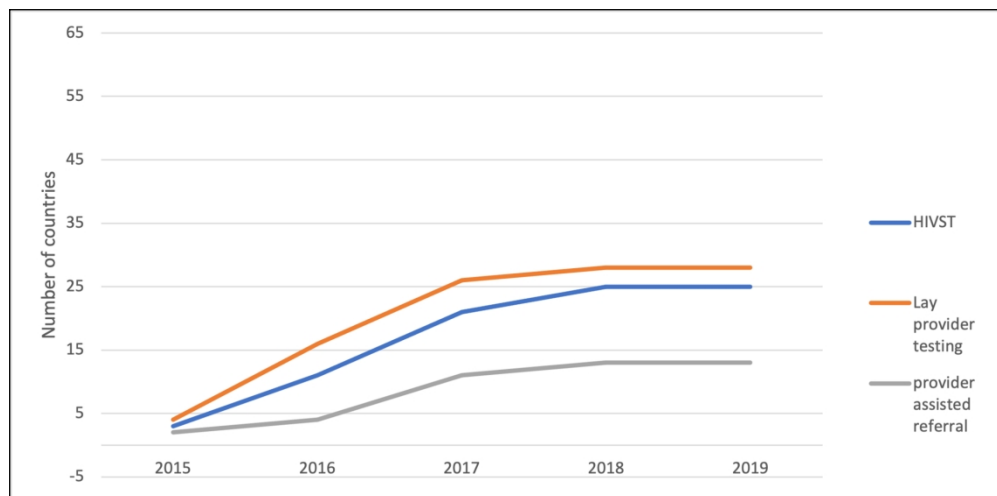


Figure 4. Number of countries including the new recommendations, by year.

176x87mm (300 x 300 DPI)

**Additional File 1: Summary of the 2015 and 2016 WHO guidelines for differentiated HIV testing services.**

<b>Box 1 WHO guidelines for differentiated HIV testing services (Source: The WHO 2015 and 2016 Consolidated guidelines on HIV testing services).</b>	
<b>HIV testing services approach</b>	
Facility-based testing (referred to a provider-initiated testing and counselling referral in the 2015 guidelines)	<p>In concentrated epidemics provider-initiated testing and counselling should be offered for clients (adults, adolescents, and children) in clinical settings who present with symptoms or medical conditions indication infection, including Tuberculosis cases.</p> <p>In all settings provider-initiated testing and counselling should be considered for malnutrition clinics, sexually transmitted infections, hepatitis and Tuberculosis services and health services for key populations.</p>
Community-based testing	<p>In generalised epidemics community-based testing should be offered to all individuals, especially key populations.</p> <p>In concentrated epidemics community-based HIV testing services is recommended for key populations.</p>
HIV Self-testing	It is strongly recommended that HIV self-testing should be offered as an additional approach to HIV testing services.
Provider assisted referral (referred to as voluntary partner notification within the 2015 recommendations)	It is strongly recommended that voluntary assisted partner notification services should be offered as part of a comprehensive package of testing and care offered to people with HIV.
<b>HIV testing services components</b>	
Pre-test information	Programmes may provide pre-test information through individual/group sessions, media and age-appropriate material when required.
Post-test counselling	Post-test counselling should be provided for all who attend testing services.
Testing by Lay Providers	It is strongly recommended that lay providers who are trained and supervised to use rapid diagnostic tests are permitted to independently conduct safe and effective HIV testing services.
<b>Population specific HIV testing</b>	

Pregnant women	<p>In high prevalence settings provider-initiated testing and counselling should be considered a routine component of antenatal clinic, childbirth, postpartum and paediatric care settings. Retesting is recommended in the third trimester, or during labour, or shortly after delivery</p> <p>In Low prevalence settings provider-initiated testing and counselling considered for all pregnant women. For pregnant women from key populations, or those with partner from key populations, HIV testing is recommended.</p>
Adolescents	In generalised epidemic HIV testing should be offered to all adolescents.
Infants and Children	In all settings HIV-exposed infants and children younger than 18 months should be tested in cases where status is unknown or uncertain.
Key Populations	It is recommended that HIV testing services are routinely recommended to key populations in community and facility-based settings.

### HTS Approaches

Facility based testing is recommended in all settings and should be considered for malnutrition clinics, sexually transmitted infections (STI), hepatitis and TB services and health services for key populations (1). Unlike voluntary testing and counselling, in facility-based testing clients are offered HIV testing with the option of 'opting out' (2). This approach to HIV testing has been shown to increase the number of people who test for HIV, one study in the USA found that 65.9% of people who were offered HIV testing accepted compared to 38% of voluntary testers (2).

In all settings community-based testing is recommended for key populations (1). Community-based testing refers to testing that is not conducted in a healthcare facility and may take different forms such as outreach testing, home-based/door-door testing (testing offered to individuals within their homes) and mobile testing (1). This has been shown to be a feasible and convenient approach to testing in some studies (3-6). Home based testing has been associated with confidentiality, credibility of tests and easily accessible counsellors, and mobile testing has been suggested to increase the number of people accessing testing services and help to overcome barriers such as long distances from clinic (7, 8).

HIVST is strongly recommended as an additional approach to HIV testing services (1). HIVST is defined as 'a process in which a person collects his or her own specimen (oral fluid or blood) and then performs an HIV test and interprets the results' (9). HIVST may increase uptake among those who never tested before by addressing barriers such as long distance transportation, long waiting times and has the potential to reduce stigmatization (10, 11). This is because HIVST can be conducted in private, or in facilities offering other services and

1  
2  
3 in populations who are at high risk, may also provide an opportunity to test more regularly  
4 (9).  
5

6  
7 Provider assisted referral (voluntary partner notification in the WHO 2015 guidelines) is a  
8 partner service which is strongly recommended (1). Partner services are defines as ‘a  
9 voluntary process whereby a trained provider asks people diagnosed with HIV about their  
10 sexual partners and/or drug injecting partners, and then, if the HIV positive clients agrees,  
11 offers there partner(s) HIV self-testing’ (9). Clients may be assisted by trained providers to  
12 disclose their status or anonymously notify sexual partners or drug injecting partners of  
13 their potential exposure to HIV, and offer HIV testing (9). This approach has been suggested  
14 to improve HIV testing services by identifying those who do not yet know their status,  
15 improving testing uptake for those who have never been tested and increase early referral  
16 to care (12-14).  
17  
18  
19

### 20 **HTS Components**

21 The 2015 consolidated guidelines recommended pre-test information instead of the  
22 previously recommended pre-test counselling(1). Previously, pre-test counselling provided  
23 comprehensive information to clients before testing to prepare clients to cope with a HIV  
24 positive diagnosis in the absence of treatment and encourage clients to return for results(1).  
25 However, the introduction of RDTs meant that individuals were now able to get results on  
26 the same day and the need for counselling before testing was no longer present and may  
27 have created barriers (1). Unlike pre-test counselling Pre-test information can be delivered  
28 in a number of formats, including to both individuals and groups, through posters,  
29 brochures, websites and short clips in waiting rooms (1). Post-test counselling is also  
30 recommended across all settings, in all HIV tests depending on the specific test result and  
31 HIV status reported (1). In order to ensure individuals are linked to the appropriate  
32 treatment and prevention services (1).  
33  
34  
35

36 Testing by trained lay providers supervised to use rapid diagnostic tests (RDTs)  
37 independently, safely and effectively (1). Testing by lay providers refers to individuals who  
38 are trained to conduct HIV tests but have no formal professional or paraprofessional  
39 certificate or tertiary education degree (1). RDT refers to a form of HIV testing that produce  
40 results quickly (usually in less than 30 minutes) enabling patients to know their result on the  
41 day in a short period of time (1). Both strategies reduce the time taken to undergo a HIV  
42 test. These components may therefore address barriers associated with time, as well as  
43 reduce the burden on resources through task shifting (15). As well as this, peer delivered  
44 testing (when lay providers are members of the same population as testers) has been shown  
45 to increase uptake, including in first time testers, and higher rates of detection of HIV cases  
46 amongst MSM and PWID in Vietnam and Thailand (16). In another study peer counsellors  
47 was identified as a facilitator for HIV testing amongst participants (3). In some populations  
48 where stigma and discrimination are present peer testing has been identified as a preferred  
49 and viable method (3, 16, 17).  
50  
51  
52  
53

### 54 **Population specific facility-based HIV testing**

55 Facility-based testing is recommended for priority populations such as pregnant women, key  
56 populations, infants and children, and adolescents (1). Diagnosing HIV as early as possible  
57 reduces mortality in infants, and in populations such as key populations and adolescents  
58  
59  
60

where testing uptake remains low differentiated testing approaches are essential in reducing barriers to testing (5, 8, 18-21).

## References.

1. WHO. Consolidated guidelines on HIV testing services. Geneva: WHO; 2015. p. 1-188.
2. Avert. HIV Testing Programmes Avert: Avert; 2019 [Available from: <https://www.avert.org/professionals/hiv-programming/testing>].
3. Woodford MR, Chakrapani V, Newman PA, Shunmugan M. Barriers and facilitators to voluntary HIV testing uptake among communities at high risk of HIV exposure in Chennai, India. *Global Public Health*. 2016;11(3):363-79.
4. Orne-Gliemann J, Zuma T, Chikocore J, Gillespie N, Grant M, Iwuji C, et al. Community perceptions of repeat HIV-testing: experiences of the ANRS 12249 Treatment as Prevention trial in rural South Africa. *AIDS Care*. 2016;28:14-23.
5. Surratt HL, O'Grady CL, Kurtz SP, Buttram ME, Levi-Minzi MA. HIV Testing and Engagement in Care among Highly Vulnerable Female Sex Workers: Implications for Treatment as Prevention Models. *Journal of Health Care for the Poor and Underserved*. 2014;25:1360-78.
6. Pharr JR, Lough NL, Ezeanolue EE. Barriers to HIV Testing Among Young Men Who Have Sex With Men (MSM): Experiences from Clark County, Nevada. *Global Journal of Health Science*. 2016;8(7).
7. Meremo A, Mboya B, Ngilangwa DP, Dulle R, Tarimo E, Urassa D, et al. Barriers to accessibility and utilization of HIV testing and counseling services in Tanzania: experience from Angaza Zaidi programme. *Pan African Medical Journal*. 2016;23(189).
8. Qiao S, Zhang Y, Li X, Menon J, Anitha. Facilitators and barriers for HIV-testing in Zambia: A systematic review of multi-level factors. *PLoS ONE*. 2018;13(2):e0192327.
9. WHO. Guidelines on HIV Self-testing and Partner notification: supplement to consolidated guidelines on HIV testing services. Geneva, Switzerland: World Health Organisation; 2016.
10. Zhang C, Xianhong L, Brecht M-L, Koniak-Griffin D. Can self-testing increase HIV testing among men who have sex with men: A systematic review and meta-analysis. *PLoS ONE*. 2017;12(11):e0188890.
11. Qin Y, Han L, Babbitt A, Walker JS, Liu F, Thirumurthy H, et al. Experiences using and organizing HIV self-testing. *AIDS*. 2018 32:371-81.
12. NAT. HIV Partner Notification: a missed opportunity. London: National AIDS Trust; 2012.
13. Dalal S, Johnson C, Fonner V, Kennedy CE, Siefried N, Figueroa C, et al. Improving HIV test uptake and case findings with assisted partner notification services. *AIDS*. 2017;31(13):1867-76.
14. Brown LB, Miller WC, Kamanga G, Nyirenda N, Mmodzi P, Pettifor A, et al. HIV Partner Notification Is Effective and Feasible in Sub-Saharan Africa: Opportunities for HIV Treatment and Prevention. *Journal of Acquired Immunodeficiency Syndrome*. 2011;56:437-42.
15. IAS. DIFFERENTIATED SERVICE DELIVERY FOR HIV: A DECISION FRAMEWORK FOR HIV TESTING SERVICES It's time to test differently.: IAS; 2018. p. 1-68.



16. Green KE, Vu BN, Huong PT, Tran MH, Ngo HV, Vo SH, et al. From conventional to disruptive: upturning the HIV testing status quo among men who have sex with men in Vietnam. 2018.
17. Ti L, Hayashi K, Kaplan K, Suwannawong P, Wood E, Montaner J, et al. Willingness to Access Peer-Delivered HIV Testing and Counseling Among People Who Inject Drugs in Bangkok, Thailand. *Journal of Community Health*. 2013;38:427-33.
18. Loos J, Manirankunda L, Hendrickx K, Remmen R, Nöstlinger C. HIV Testing in Primary Care: Feasibility and Acceptability of Provider initiated HIV Testing and Counseling for Sub-Saharan African Migrants. *AIDS Education and Prevention*. 2014;26(1):81-93.
19. Traversy GP, Austin T, Timmerman K, Gale-Rowe M. An overview of recent evidence on barriers and facilitators to HIV testing. *Canada Communicable Disease Report*. 2015;41(12).
20. DHS. Demographic patterns of HIV Testing Uptake in Sub-Saharan Africa. Calverton, Maryland, USA: ICF International; 2013.
21. Huong NTT, Hau NT, Chau NV, Tan LT, Tam NTM, Gray R, et al. Perceived barriers and facilitators to uptake of HIV testing services among people who inject drugs in Vietnam. *Journal of Substance Use*. 2018;23(6):551-6.

	Compliant
	Not complaint
	Unclear
	Concentrated epidemis
	Generalised epidemic
	Not reccomended in this country setting

WHO region	Country	Year
AFR	Angola	2015
AMR	Argentina	2015
WPR	Australia	2017
AFR	Benin	2017
AFR	Botswana	2016
EUR	Bulgaria	2017
AFR	Cameroon	2018
EUR	Denmark	2015
WPR	China	2015
EUR	France	2017
AFR	Côte d'Ivoire	2016
EUR	Croatia	2017
AMR	Guatamala	2018
EUR	Czech Republic	2018
SEAR	India	2015
EMR	Egypt	2015
EUR	Italy	2016
EUR	Kazakhstan	2015
AFR	Ethiopia	2017
EUR	Finland	2018
AFR	Ghana	2017
EUR	Georgia	2016
EUR	Lithuania	2017
EUR	Germany	2015
AMR	Haiti	2015
AFR	Guinea	2018
AFR	Kenya	2015
EUR	Ireland	2015
AFR	Lesotho	2016
AFR	Liberia	2015
EUR	Luxembourg	2017
EUR	Netherlands	2017
AFR	Malawi	2016
WPR	Malaysia	2015
AFR	Mali	2017
EUR	Russia	2016
AFR	Mozambique	2015
SEAR	Myanmar	2017
AFR	Nigeria	2016

1			
2	EMR	Oman	2015
3	EMR	Pakistan	2017
4	EUR	Romania	2017
5	AFR	Rwanda	2016
6	AFR	Senegal	2017
7	AFR	Sierra Leone	2017
8	EUR	Slovenia	2017
9	EUR	Slovakia	2017
10	EMR	Somalia	2017
11	EUR	Sweden	2017
12	AFR	South Africa	2016
13	EMR	South Sudan	2017
14	SEAR	Sri Lanka	2016
15	AMR	Cayman Islands	2015
16	SEAR	Thailand	2017
17	EMR	Sudan	2016
18	EUR	Ukraine	2016
19	AFR	Swaziland	2018
20	AFR	Tanzania	2017
21	AFR	Uganda	2016
22	EUR	United Kingdom	2016
23	AMR	United States of America	2017
24	WPR	Vietam	2018
25	WPR	Nauru	2015
26	AFR	Zambia	2016
27	AFR	Zimbabwe	2018
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
54			
55			
56			
57			
58			
59			
60			

# Extraction Tool (Coun

HTS APPROCHES			
Community-based testing	provider assisted referral	HIV- self testing	Pre-test information
u	u	u	u
y	n	n	u
y	y	n	n
y	y	u	y
y	n	n	n
y	n	n	n
y	y	exploring	n
n	n	n	n
y	n	y	n
n	n	y	n
y	n	y	n
y	n	n	n
n	n	n	n
y	n	y	n
n	n	n	n
n	n	n	n
y	n	n	y
y	n	n	n
y	y	y	u
y	n	n	n
n	n	n	n
y	n	n	n
y	y	n	n
y	n	n	n
y	n	y	y
y	y	n	n
y	n	y	n
n	n	u	n
y	n	n	n
n	n	y	n
y	n	y	n
y	n	n	n
y	y	y	n
n	n	n	n
y	n	n	n
y	y	n	n
y	y	y	n
n	n	n	n
y	n	n	n
y	y	n	n
y	y	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

y	n	n	y
y	y	y	y
y	n	y	y
y	n	n	n
y	y	y	n
y	n	n	y
y	n	y	n
n	n	n	n
y	n	y	y
n	n	n	n
y	y	y	y
y	n	y	y
y	n	n	y
n	n	n	n
n	n	n	n
y	n	n	y
n	n	n	u
y	y	y	y
y	y	n	y
y	n	y	n
y	y	y	y
y	n	n	n
y	u	y	y
n	n	n	n
y	n	y	y
y	n	y	y

Review only

# try uptake of WHO recommendations on differentiate

HTS COMPONENTS			
Pre-test counselling	post-test counselling	Lay provider HIV testing	Rapid Diagnostic tests
y	u	u	y
y	y	y	y
n	n	u	y
n	y	y	y
y	y	y	y
n	n	n	n
y	y	n	u
n	n	n	n
n	y	n	y
n	n	n	y
y	y	y	y
y	y	n	y
n	n	n	n
n	n	n	y
y	y	n	n
y	y	n	y
n	n	n	n
y	y	n	n
n	y	y	y
n	n	n	n
y	y	y	y
n	n	n	n
n	n	n	y
n	n	n	n
y	y	y	y
n	n	n	y
y	y	y	y
n	n	n	n
y	y	y	y
n	n	y	y
y	y	y	n
n	n	n	n
y	y	n	y
n	n	y	y
n	y	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

n	y	n	y
n	y	y	y
n	y	n	y
y	y	y	y
y	y	n	n
n	y	y	y
n	n	n	y
n	n	n	n
n	y	y	y
n	n	n	n
n	y	y	y
y	n	y	y
y	y	n	n
n	n	n	n
y	y	y	y
u	n	n	y
n	y	y	y
n	y	y	y
y	n	y	y
n	y	y	y
n	n	n	n
n	y	y	u
n	n	n	y
n	y	y	y
n	y	u	y

Review only

**d HIV testing services approaches: a global policy review)**

POPULATION SPECIFIC FACILITY BASED HIV TESTING			
Adolscents	Pregnant women	Key Populations	Infants and Children
y	y	u	y
y	y	y	n
n	y	y	y
n	y	y	y
y	y	n	y
y	y	y	u
y	y	y	y
n	n	y	n
n	y	n	y
n	y	y	n
y	y	y	y
y	y	y	n
n	y	n	y
n	y	n	n
n	n	n	y
n	y	y	y
n	y	y	y
n	y	n	n
y	y	y	y
n	y	y	u
y	y	y	y
n	y	y	u
n	n	n	n
n	n	y	n
y	y	y	y
n	y	y	y
y	y	y	y
n	y	y	n
y	y	y	y
n	y	n	y
n	y	y	n
y	y	n	n
y	y	y	y
y	y	y	y
y	y	y	y
n	n	n	n
y	y	y	y
y	y	y	y
y	y	y	y



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

n	y	y	y
y	y	y	y
y	y	y	y
y	y	y	y
n	y	y	n
y	y	y	y
n	y	y	n
n	y	y	y
y	y	y	y
n	n	n	n
y	y	y	y
y	y	y	y
y	y	y	y
n	n	n	n
n	n	n	n
n	y	y	y
n	y	n	n
y	y	y	y
y	y	y	y
y	y	y	y
n	y	y	y
n	n	y	n
n	n	y	y
n	y	n	n
y	y	y	y
y	y	y	y

Review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

EPIDEMIC SPECIFIC		
Epidemic type	Community-based testing in concentrated and generalised epidemics	Facility based testing for all adolescents in all clinical settings in generalised epidemics
c	u	
c		
c	y	
g	y	n
g	y	u
g	y	y
c	n	
c	n	
g	y	y
c	n	
c	n	
c	n	
c	y	
c	y	
c	n	
c	y	
g	y	y
g	y	y
g	y	y
g	n	n
c	n	
g	y	y
c	y	
c	y	
c	n	
g	y	y
g	y	y
g	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

c	y	
g	y	y
c	y	
g	y	y
g	y	y
g	y	y
g	y	y
c	n	
c	u	
g	y	y
g	y	y
g	y	y
c	y	
c	y	
c	y	
g	y	y
g	y	y

Review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

---

Facility based testing for those with symptoms in concentrated epidemics
u
y
y
y
y
u
y
y
y
u
y
u
y
y
y
y

For peer review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

y
y
y
u
y
y
u

For peer review only

# BMJ Open

## Country uptake of WHO recommendations on differentiated HIV testing services approaches: a global policy review

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2021-058098.R1
Article Type:	Original research
Date Submitted by the Author:	07-Apr-2022
Complete List of Authors:	Kadye, Tafadzwa; UCL, Global Health Jamil, Muhammad; World Health Organization, Johnson, Cheryl; World Health Organization, Department of HIV/AIDS Baggaley, R; World Health Organization Barr-DiChiara, Magdalena; World Health Organization, Department of Global Programmes of HIV, Hepatitis and HIV Cambiano, Valentina; UCL
<b>Primary Subject Heading</b>:	HIV/AIDS
Secondary Subject Heading:	Health policy, Infectious diseases, Sexual health
Keywords:	HIV & AIDS < INFECTIOUS DISEASES, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Public health < INFECTIOUS DISEASES

SCHOLARONE™  
Manuscripts



I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our [licence](#).

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which [Creative Commons](#) licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

1  
2  
3  
4  
5 **Target journal:** BMJ Open  
6  
7  
8  
9

10 **Title:** Country uptake of WHO recommendations on differentiated HIV testing services approaches:  
11 **a global policy review**  
12  
13

14  
15  
16 **Authors:** Tafadzwa Kadye<sup>1§</sup>, Muhammad S. Jamil<sup>2</sup>, Cheryl Johnson<sup>2</sup>, Rachel Baggaley<sup>2</sup>,  
17  
18 Magdalena Barr-Dichiara<sup>2</sup>, Valentina Cambiano<sup>3</sup>  
19

20  
21 Affiliations:  
22

- 23 1. Global HIV, Hepatitis and STIs Programme, World Health Organization, Geneva,  
24 Switzerland  
25
- 26 2. Institute for Global Health, University College London, London, UK  
27  
28  
29

30  
31 <sup>§</sup> Corresponding author: Tafadzwa Kadye,  
32

33 Phone: 07392170704  
34

35 Email: tafadzwa.kadye.18@ucl.ac.uk  
36  
37

38 TK: tafkadye@gmail.com  
39

40 MSJ: mjamil@who.int  
41

42 CJ: johnsonc@who.int  
43

44 RB: baggaleyr@who.int  
45

46 MBD: barrdichiam@who.int  
47

48 VC: v.cambiano@ucl.ac.uk  
49  
50

51 **Keywords:** HIV testing; HIV self-testing; community-based testing; partner services;  
52 differentiated service delivery; key populations ;  
53  
54

55  
56 **Word count:**

57  
58 **Abstract:**327/300

59  
60 **Main text:** 3994/5000



## Abstract

**Objectives** In 2015 and 2016 the World Health Organization (WHO) issued guidelines on HIV testing services (HTS) highlighting recommendations for a strategic mix of differentiated HTS approaches. The policy review examines the uptake of differentiated HTS approaches recommendations in national policies.

**Methods** Data were extracted from all available national policies published between January 2015 and June 2019 stored in WHO's global policy repository. The WHO recommended HTS approaches included facility-based testing, community-based testing, HIV self-testing and provider-assisted referral (or assisted partner notification); . Other supportive recommendations considered include pre-test information, post-test counselling, lay provider testing and rapid testing. Descriptive analyses were conducted to examine inclusion of WHO differentiated HTS and supportive recommendations in national policies.

**Results** Of 194 countries worldwide, 65 published policies were identified in the review period. 24 out of 47 AFR countries (51% of AFR, 24/47), 21 the EUR (40%, 21/53), the EMR (29%, 6/21), five the AMR (14%, 5/35), the WPR (19%, 5/27) and four the SEAR (36%, 4/11). Only five countries included all recommendations while 63 included a minimum of one recommendation. The majority (85%, n=55) included facility-based testing for pregnant women, 75% (n=49) facility-based testing for key populations, 74% (n=48) community-based testing for key populations, 69% (n=45) rapid testing, 57% (n=37) post-test counselling, 45% (n=29) lay provider testing, 38% (n=25) HIV self-testing, 29% (n=19) pre-test information and 25% (n=16) provider-assisted referral. Of the 65 policies countries in AFR and EMR included the most WHO differentiated HTS recommendations at the time of publication.

**Conclusion** There was substantial variability in the uptake of WHO HTS recommendations in national policies. Among the countries included, those in EMR region showed the highest included the most WHO differentiated HTS recommendation followed by AFR countries. Countries within AMR showed to include the least number of recommendations, of the 65 policies reviewed at the time of this review. Ongoing advocacy and efforts are need to support the uptake of WHO differentiated HTS recommendations in country policies as well as their implementation.

1  
2  
3 32  
4  
5 33  
6  
7 34  
8  
9 35  
10 36  
11  
12 37  
13  
14 38  
15 39  
16  
17 40  
18  
19 41  
20 42  
21 43  
22 44  
23 45  
24 46  
25 47  
26 48  
27 49  
28 50  
29 51  
30 52  
31 53  
32 54  
33 55  
34 56  
35 57  
36 58  
37 59  
38 60  
39 61  
40 62  
41 63  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

### Strengths and limitations of this study

- We conducted a comprehensive review of available national policies to understand the uptake of WHO recommendations on differentiated HTS. Policies were included regardless of language including translation of 34 non-English language policies.
- Not all country policies were available within the WHO repository and therefore no information could be extracted for these countries. Availability in policies also varied across regions therefore some regions were more comprehensively represented.
- The review was limited to the 2015 WHO differentiated HTS recommendations due to the timeline in which it was written.
- In 2019 WHO introduced recommendations for social network based approaches. These recommendations were published following the review period and were therefore not included due to timelines.
- HTS policy uptake is often not reflective of implementation. Further work is needed to understand implementation status and address any gaps.

1  
2  
3 64  
4  
5 65  
6  
7 66  
8  
9 67  
10  
11 68  
12  
13 69  
14  
15 70  
16  
17 71  
18  
19 72  
20  
21 73  
22  
23 74  
24  
25 75  
26  
27 76  
28  
29 77  
30  
31 78  
32  
33 79  
34  
35 80  
36  
37 81  
38  
39 82  
40  
41 83  
42  
43 84  
44  
45 85  
46  
47 86  
48  
49 87  
50  
51 88  
52  
53 89  
54  
55 90  
56  
57 91  
58  
59 92  
60

## Introduction

HIV testing services (HTS) are essential in identifying individuals who are unaware of their HIV status, linking HIV positive individuals to treatment and HIV negative individuals to prevention services. In 2021 85% of people living with HIV were aware of their HIV status<sup>1</sup>. At least 8 countries globally reported having reached the 90-90-90 targets in 2020, and in 2021 UNAIDS announced new targets of 95-95-95 by 2025<sup>2-4</sup>.

Testing uptake remains particularly low among key populations. Key populations are defined as men who have sex with men (MSM), sex workers, people who inject drugs (PWID), people in prisons and closed settings and transgender people. They make up nearly two-thirds (65%) of all new infections<sup>3 5 6</sup>. Men and young people also have low uptake and access to services<sup>7-12</sup>. In all populations with low uptake, particularly key populations, identified barriers to testing include stigma and discrimination. Structural barriers including accessibility of services, inconvenient clinic hours and opportunity costs for clients have also been identified amongst all populations<sup>7-12</sup>.

In 2015 the World Health Organization (WHO) published the first consolidated guidelines on HTS, followed by supplementary guidance recommending HIV self-testing (HIVST) and provider-assisted referral (also referred to as “assisted partner notification”) in 2016<sup>6</sup>. In 2019 the WHO published updated consolidated guidelines for HTS which include a new recommendation on social network-based approaches for HIV testing and updated guidance on HIVST and counselling message<sup>13 14</sup>. WHO guidelines encourage a strategic mix of differentiated HTS approaches with a focus on priority populations and people with HIV who do not know their status and areas with greatest gaps<sup>6 13</sup>. Differentiated HTS approaches refer to tailored and ‘client-centred’ approaches and they address barriers individuals have in accessing HTS<sup>15</sup>. The guidelines include recommendations for HTS approaches and HTS

1  
2  
3 95 components taking into account the population, epidemic and context. See supplementary  
4 information (additional file 1) for a summary of the 2015 and 2016 WHO guidelines on HTS.  
5  
6

7 97  
8  
9 98 It is important to monitor the uptake of these recommendations into country policies in  
10 order to promote the inclusion of WHO recommendations into those countries and  
11 99 prioritize support. In doing so supporting countries to improve the uptake of HTS, and  
12 100 achieve the Global 95-95-95 goals. Global monitoring of WHO guidelines uptake in national  
13 101 policies is routinely undertaken as part of Global AIDS Monitoring system <sup>16</sup>. However an in-  
14 102 depth understanding of adoption of WHO HTS guidelines at national level and in varying  
15 103 epidemic contexts is lacking. Understanding this will enable a better knowledge of where  
16 104 gaps in service may exist, and where further support may be provided to countries. To this  
17 105 end, we reviewed national HTS policies to examine the uptake of 2015 WHO HTS  
18 106 recommendations on differentiated testing services.  
19 107  
20 108

## 29 109 **Methods**

### 31 110 32 111 **Search strategy**

33 112  
34 113 A comprehensive search of national HTS policy documents was undertaken using the  
35 114 existing [WHO national policy repository](#)<sup>17</sup>. The repository was first produced in 2015 and is  
36 115 routinely updated by WHO staff using a AIDSFree HTS policy database, Country by country  
37 116 search of IAPAC/HIV Policy Watch website and a broad Google search. The google search  
38 117 using the following key words:

- 39 118 • country name AND “HIV testing” AND policy
- 40 119 • country name AND “HIV testing” AND guideline
- 41 120 • country name AND PrEP AND policy
- 42 121 • country name AND PrEP AND guideline
- 43 122 • country name AND “pre-exposure prophylaxis” AND policy
- 44 123 • country name AND “pre-exposure prophylaxis” AND guideline The policy repository is  
45 124 maintained by WHO.

46 125 The repository includes national policies relating to HTS, HIV counselling services,  
47 126 prevention services, antiretroviral therapy (ART), as well as policies relating to prevention of  
48 127 mother-to-child transmission, HIV partner services, national HTS action/strategic plans, and  
49 60

1  
2  
3 128 differentiated service delivery. In addition, national policies relating to sexual health, and  
4  
5 129 sexually transmitted infections were also included. All available national policies were used  
6  
7 130 for data extraction.

8  
9 131  
10 132 For inclusion, national policies needed to include HTS and be published between January  
11  
12 133 2015, after the release of the 2015 WHO consolidated guidelines, and June 2019. The most  
13  
14 134 recent available policy document containing information on HTS was used for extraction.

15  
16 135  
17  
18 136 The national policies included were reviewed against WHO recommendations published in  
19  
20 137 2015/2016. Given the review end date of June 2019 the WHO 2019 guidelines were not  
21  
22 138 included as they were published in December 2019. Policies in languages other than English  
23  
24 139 were translated using google translate. One country gave policy documents in formats that  
25  
26 140 did not permit translation and was therefore excluded. Please see further details on the  
27  
28 141 process to identify country policies including HTS recommendations in Figure 1.

29 142

### 30 143 **Data extraction**

31  
32 144 Data was extracted by one author (TK) into an Excel spreadsheet. The HTS approaches  
33  
34 145 considered are: (1) facility-based testing for pregnant women (1a), adolescents (1b), infants  
35  
36 146 and children (1c), and key populations (1c); (2) community-based testing, including  
37  
38 147 community-based testing for specific populations; (3) HIV self-testing and (4) provider-  
39  
40 148 assisted referral. Additional supportive HTS recommendations considered were: (5) pre-test  
41  
42 149 information, (6) post-test counselling, (7) lay provider testing and (8) rapid testing. In the  
43  
44 150 2015 guidelines pre-test information was recommended instead of pre-test counselling,  
45  
46 151 however data for pre-test counselling was extracted to better understand if countries were  
47  
48 152 still recommending this component. The 2015 WHO consolidated guidelines and 2016  
49  
50 153 Guidelines on HIV Self-testing and Partner notification were used.

51 154

### 52 155 **Data analysis and reporting**

53 156

54  
55  
56 157 We estimated the number and proportion of countries in each WHO region that had a  
57  
58 158 relevant policy in the period of review (76%: 148/194). This was done overall (worldwide)  
59  
60 159 and stratified by WHO region and epidemic type defined by generalised ( $\geq 5\%$  HIV

1  
2  
3 160 prevalence) and concentrated (<5%) HIV prevalence) epidemics (now often referred to as  
4  
5 161 high or low burden settings). This last stratification was included given some  
6  
7 162 recommendations were epidemic type specific: in particular routine facility-based testing  
8  
9 163 for those with signs and symptoms, adults, adolescents and children apply only to  
10  
11 164 concentrated epidemics and community-based testing for adolescents apply to both  
12  
13 165 generalised epidemics.

14 166 Policies were categorised in three groups:

- 16 167 • Included: Policies that clearly and explicitly stated and included a specific  
17  
18 168 recommendation
- 20 169 • Not included: Policies that did not include a specific recommendation
- 22 170 • Unclear: Policies in which it was unclear whether a WHO recommendation was  
23  
24 171 included due to insufficient information.

25 172 Analyses were conducted in Microsoft Excel.

26  
27 173

## 29 174 **Results**

### 31 175 32 176 **Characteristics of included policies**

34 177 Of 194 WHO member states 148 countries had at least one policy within the WHO national  
35  
36 178 policy repository. Of these, 65 country policies were eligible to be included; 30 were HIV  
37  
38 179 testing policies, 15 national strategic plans, 12 integrated guidelines for HTS, eight were  
39  
40 180 related policies reporting on HIV testing (one HIV counselling policies, one ART policy, one  
41  
42 181 integrated guidelines for STIs, one sexual health national strategic plan, one policy on HIV  
43  
44 182 contact management, one global AIDS progress report, one differentiated testing guideline  
45  
46 183 and one policy on community-based testing). Overall, 34 (52%) country policies were in  
47  
48 184 English. 82 country policies were excluded because they were published before January  
49  
50 185 2015. Morocco's latest policy documents (written in French) were in formats that did not  
51  
52 186 permit translation. No other policies were available for Morocco in the timeframe of  
53  
54 187 interest; therefore, we could not include Morocco.

54 188

55  
56 189 *Figure 1.* Process to identify country policies including recommendations on HIV testing services. 82 country  
57  
58 190 policies were excluded as they were published before January 2015.

59 191

1  
2  
3 192 Of the 65 country policies reviewed, 24 were from AFR (51% of 47 countries), 21 from the  
4  
5 193 WHO European region (EUR; 40% of 53 countries), six from the WHO Eastern Mediterranean  
6  
7 194 region (EMR; 29% of 21 countries), five from the Pan American region (AMR; 14% of 35  
8  
9 195 countries), five from the Western Pacific Region (WPR; 19% of 27 countries) and four from  
10  
11 196 the WHO South East Asia Region (SEAR; 36% of 11 countries). Just over two-thirds (37%,  
12  
13 197 24/65) policies were from countries classified as having a concentrated epidemic, 34%  
14  
15 198 (22/65) from a generalised epidemic.

16 199  
17 200  
18 201

19 202 *Figure 2. Countries with a national policy identified between January 2015 and June 2019.* A map of all 65  
20 203 countries within this review (n=65). Countries highlighted in orange are those that included all  
21 204 recommendations relevant to their country setting (n=5).  
22 205

## 23 206 **Overall uptake of WHO HTS recommendations in national policies**

24 207 Only five country policies included all the relevant recommendations (see Figure 2). Among  
25 208 recommendations on HTS approaches and components applicable to all settings and  
26 209 populations (Figure 3): 69% (45/65) included rapid testing, 45% (29/65) permitted lay  
27 210 provider testing, 38% (25/65) of countries supported HIVST, 35% (23/65) included pre-test  
28 211 counselling and did not specify the use of pre-test information, 35% included (37/65) post-  
29 212 test counselling, 29% (19/65) included pre-test information and 25% (16/65) supported  
30 213 provider-assisted referral.  
31 214

32 215 Regarding recommendation for specific sub-populations (Figure 4 on the left), 85% (55/65)  
33 216 included recommendations for testing for pregnant women, 75% (49/65) recommended  
34 217 testing for key populations, 71% (17/24) recommended facility-based testing for all those  
35 218 presenting with signs and symptoms, 74% (48/65) recommended community-based testing  
36 219 for key populations and 65% (42/65) recommended facility-based testing for infants and  
37 220 children. Of countries with a concentrated epidemic (n=24), 71% (17/24) recommended  
38 221 facility-based testing for all those presenting with signs and symptoms. Of those with a  
39 222 generalised epidemic (n=22), 86% (19/22) recommended facility-based testing for  
40 223 adolescents.  
41 224

1  
2  
3 228  
4

5 229 **Figure 3. Number of countries that included recommendations valid in all settings and populations from the 2015 WHO consolidated guidelines for HTS,**  
6  
7 230 **by type of recommendation and WHO region.**

8 231 AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region.

9 232

10 233

11 234

12 235

13 236

14 237

15 238 **Figure 4 f Number of countries included in the review that included population or epidemic specific recommendations from the 2015 WHO consolidated**  
16  
17 239 **guidelines for HTS, by type of recommendation and WHO region.**

18 240 AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region;

19 241 Facility-based testing for key populations here refers to provider-initiated testing and counselling this is recommended in malnutrition clinics or sexually transmitted infections (STI) or hepatitis and Tuberculosis  
20 242 services or health services for key populations in all settings. Facility-based testing for pregnant women, infants and children applies to all countries (n=65). Community-based testing for key populations applies to all  
21 243 countries (n=65).

22 244 Facility-based testing for all those presenting with signs and symptoms is recommended only in countries with a concentrated epidemic (n=24); facility-based testing for adolescents only in countries with a  
23 245 generalised epidemics (n=22).  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46



## 246 **Uptake of WHO recommended HTS approaches by WHO region**

247 The uptake of recommendations varied across countries (see uptake of single  
248 recommendations for each country in additional file 2) and regions. HIVST was  
249 recommended by 38% (25/65) of countries. The inclusion of HIVST ranged from EMR (67%;  
250 4/6), AFR (54%; 13/24), WPR (40%; 2/5) and EUR (29%; 6/21). No included countries from  
251 SEAR and AMR supported HIVST at the time of review.

252

253 Only 25% (13/65) of countries included recommendations for provider-assisted referral:  
254 38% of AFR (9/24) countries, 33% of EMR (2/6), 20% (1/5) of AMR, 10% (2/21) of EUR, , 5%  
255 (1/4) of SEAR and in 5% (1/5) of WPR.

256

257 Pre-test information was included in 29% (19/65) of country policies. The inclusion of pre-  
258 test information ranged from EMR (83%; 5/6), followed by the AFR (42%; 10/24), WPR (20%;  
259 1/5), SEAR (25%; 1/4) and EUR (10%; 2/21). No countries from AMR included this  
260 recommendation at the time of the review.

261

262 Overall 57% (37/65) of countries recommended post-test counselling, with variation across  
263 regions (100% EMR, 88% AFR, 40% WPR, 25% AMR, 25% SEAR, and 19% EUR). Whilst pre-  
264 test counselling is no longer recommended by WHO, it was still included by 35% (23/65) of  
265 countries: (60% AMR, 58% AFR, 50% SEAR, 33% EMR and 10% EUR) while no countries in the  
266 WPR included this recommendation.

267

268 Rapid testing was included in 69% (45/65) of country policies, with regional variation (100%  
269 EMR, 88% AFR, 80% WPR, 50% SEAR, 48% EUR and 40% AMR). Lay provider testing was  
270 permitted in 45% (29/65) of countries (75% AFR, 67% EMR, 50% SEAR, 40% WPR, 20% AMR,  
271 and 5% EUR).

272

273

274

275 *Figure 5. Number of countries including the new recommendations, by year.*

276

277  
278 Lay Provider testing was recommended for the first time by WHO in 2015 and provider-  
279 assisted referral and HIVST in 2016. Figure 5 shows the number of countries including the  
280 new recommendations in their policies in the years following their introduction. A steep  
281 increase in uptake can be observed with 16, 25 and 29 countries including recommendation  
282 on respectively provider-assisted referral, HIVST and lay provider testing by June 2019.

283

284

### 285 **Uptake of population specific HTS approaches by WHO region**

286 Facility-based testing for pregnant women was recommended by 85% (55/65) of countries,  
287 including all countries in EMR (100%; 6/6) and AFR (100%; 24/24) followed by WPR (80%;  
288 4/5), EUR (76%; 16/21), AMR (60%;3/5) and SEAR (50%;2/4). Nearly two-thirds of countries  
289 (65%, 42/65) of countries recommended facility-based testing for infants and children  
290 (100% EMR, 76% AFR, 80% WPR, 75% SEAR, 40% AMR and 19% EUR).

291

292 Facility-based testing for key populations is recommended in 49 countries (100% EMR, 88%  
293 AFR, 67% EUR, 60% AMR, 60% WPR and 50% SEAR). Of the countries that recommended  
294 facility-based testing for key populations, 69% (34/49) recommended targeted testing for  
295 MSM, 59% (29/49) for sex workers or those who engage in transactional sex, 57% (28/49)  
296 for PWID, 45% (22/49) for prisoners and 18% (9/49) for transgender people. Inclusion  
297 ranged with countries from the EMR starting from 100% (6/6) uptake, as well as AFR (88%;  
298 21/24), the EUR (66%;14/21) and WPR (60%; 3/5), while it was lower in the AMR (60%; 3/5)  
299 and the SEAR (50%; 2/4).

300

301 Nearly a quarter (74%, 48/65) of countries recommended community-based testing for key-  
302 populations. Uptake of community-based testing varied by region (100% EMR, 88% AFR,  
303 80% WPR, 52% EUR, 50% SEAR and 20% AMR). Of the countries that included community-  
304 based testing for key populations; ,44% (21/48) home-based/door-door testing, 38% (18/48)  
305 included outreach services, 35% (17/48) workplace testing, 35% (17/48) mobile testing, 23%  
306 (11/48) testing within educational establishments, 15% (7/48) testing in places of worship  
307 and 13% (6/48) recommended testing in community health centres.

308

1  
2  
3 309 Of the countries classified as having a concentrated epidemic, 37% (n=24), 20% (5/24) were  
4  
5 310 in the AFR region, 46% (11/24) in EURO, 12% (3/24) in AMR, 8% (2/24) in SEAR, 8% (2/24) in  
6  
7 311 WPR and 4% (1/24) in EMR. 72% (18/24) of these countries recommended facility-based  
8  
9 312 testing for all those presenting with signs and symptoms of HIV. 34% (n=22) of countries  
10  
11 313 were classified as having a generalised epidemic. Amongst the countries with a generalised  
12  
13 314 epidemic 100% (22/22) recommended routine facility-based testing for adolescents.

14 315

15 316

## 18 317 **Discussion**

20 318 Across all country policies reviewed, only five countries (in 3 AFR, 1 EMR and 1 EUR)  
21  
22 319 included all the WHO HTS recommendations (relevant to their country setting) with gaps in  
23  
24 320 uptake remaining. 63 countries included at least one recommendation. The uptake of  
25  
26 321 recommendation in some country policies, although varied, does however suggest that it is  
27  
28 322 feasible to adapt latest policies within a short time frame. We found high uptake of  
29  
30 323 recommendations for community-based testing, first recommended in 2013<sup>18</sup>. The uptake  
31  
32 324 of recommendations first issued in 2016 (HIVST and provider-assisted referral) was low,  
33  
34 325 with less than half of countries recommending both. This may be due to their later  
35  
36 326 introduction to recommendations; although the uptake was increasing steadily. Population  
37  
38 327 specific facility-based testing recommendations were generally taken up for pregnant  
39  
40 328 women and, infants and children and key populations. Among countries with generalised  
41  
42 329 and concentrated epidemics, there was high uptake of community-based testing for key  
43  
44 330 populations; while, only half of countries recommended mobile testing explicitly, and just  
45  
46 331 over two fifths recommended outreach testing. These methods are likely to increase the  
47  
48 332 uptake of HIV testing for key populations, by reducing barriers to access to testing such as  
49  
50 333 stigma and discrimination.

51 334

52 335 As of 2019, 81% of all people with HIV are estimated to have been diagnosed globally<sup>2</sup>.  
53  
54 336 Differentiated testing approaches are critical for reaching the remaining people with HIV as  
55  
56 337 standard testing services have not been successful in serving them. WHO recommends a  
57  
58 338 strategic mix of HTS depending on the epidemiology, context and focus populations. The  
59  
60 339 variations in uptake suggest that further research is required to understand why some

1  
2  
3 340 countries did not include the WHO differentiated HTS recommendations, and what support  
4  
5 341 countries require to include recommendations. National policies often did not elaborate  
6  
7 342 how various approaches will be used within a differentiated HTS plan to reach national goals  
8  
9 343 and specific service delivery models and support tools. Moreover, inclusion of  
10  
11 344 recommendations in policies does not always directly lead to implementation or scale up of  
12  
13 345 effective practices. Further monitoring is needed to understand the implementation status  
14  
15 346 of services as well as their scale and coverage.

16 347

17  
18 348 Both HIVST and provider assisted referral have been found to be acceptable and feasible to  
19  
20 349 implement, and in reaching people who would not otherwise have tested for HIV<sup>19 20</sup>. A  
21  
22 350 steady increase in the number of countries adopting these recommendations within  
23  
24 351 national policies has been observed. According to latest Global AIDS Monitoring, as of 2021  
25  
26 352 94 countries globally report inclusion of HIVST in national policies and 48 of them are  
27  
28 353 routinely implementing HIVST<sup>2</sup>.

29 354

30  
31 355 Since 2015, WHO has recommended a brief pre-test information when offering HTS instead  
32  
33 356 of detailed pre-test counseling. Evidence and programmatic experiences suggest lengthy  
34  
35 357 pre-test counselling is no longer needed and may in fact deter some testers from seeking  
36  
37 358 HTS, such as repeat testers. Our review shows many countries may still be continuing to  
38  
39 359 include traditional pre-test counselling within their national policies. Traditional pre-test  
40  
41 360 counselling reduces the efficiency of HTS and does not represent the best use of scarce  
42  
43 361 human and financial resources<sup>6</sup>. Anecdotal evidence suggests many countries provide post-  
44  
45 362 test counselling that includes outdated information. For example, many programmes had  
46  
47 363 not adapted counselling messages to include information of prevention benefits of  
48  
49 364 treatment and achieving viral suppression for partners (undetectable=untransmissible or  
50  
51 365 U=U), availability of effective prevention options such as pre-exposure prophylaxis (PrEP)  
52  
53 366 and messages on optimal testing frequency based on risk and epidemiology. Countries need  
54  
55 367 to review and revise their policies to adopt latest WHO recommendation on pre-test  
56  
57 368 information and post-test counselling.

58 369

59 370 Over two thirds of countries included in this review support the use of rapid HIV testing,  
60  
371 which can provide same day diagnosis, facilitating rapid initiation of ART. WHO recommends

1  
2  
3 372 the use of trained lay providers and peers for delivering HTS using RDTs. However, of the  
4  
5 373 countries that included RDT in their policies, few included the use of lay providers. Lay  
6  
7 374 providers can affect expansion of services by enabling testing at places accessible and  
8  
9 375 convenient to populations or groups most affected with HIV . This includes the introduction  
10  
11 376 and scale up of community-based testing. Countries need to review their policies to address  
12  
13 377 legal barriers to use of trained lay providers and develop standard operating procedures and  
14  
15 378 training material and supervision activities for this cadre of providers.

16 379

17  
18 380 Our review found variations in policy uptake by region. Overall countries in EMR region  
19  
20 381 showed the highest uptake followed by AFR countries, while countries within AMR showed  
21  
22 382 to have the lowest uptake of recommendations. Countries within SEAR, EUR and WPR also  
23  
24 383 showed a lower uptake. These findings need to be interpreted with caution as we identified  
25  
26 384 a small number of policies from regions other than AFR and thus may not be representative  
27  
28 385 of overall situation in the regions. It is encouraging that the uptake of WHO policies was  
29  
30 386 high in AFR given the countries in this region represent the highest burden of both  
31  
32 387 diagnosed and undiagnosed HIV infection<sup>2</sup>.

33 388

34 389 Overall, our review findings suggest that regular monitoring and better understanding of  
35  
36 390 country uptake of WHO recommendations is needed to address country support needs to  
37  
38 391 address such gaps. It is important to consider that inclusion of recommendations in national  
39  
40 392 policies does not necessarily reflect that they are implemented and often there is a gap  
41  
42 393 between policy uptake and implementation. Efforts are needed to enhance country policy  
43  
44 394 uptake and minimize the lag in implementation. It is also important to note that whilst this  
45  
46 395 review focuses on the inclusion of recommendation from the 2015 WHO consolidated  
47  
48 396 guidelines, national HTS policies were already in existence before this date. All stakeholders  
49  
50 397 including international organizations, implementing partners, and donors need to support  
51  
52 398 the governments and national programmes in updating national policies and translating  
53  
54 399 these into implementation. Community groups and civil society need to advocate for  
55  
56 400 availability of latest and evidence-based recommendations and interventions in their  
57  
58 401 countries. Further support may be needed in operationalization and scale up of such  
59  
60 402 policies, and strategies focusing on key populations are required in some settings. Regular

1  
2  
3 403 monitoring of country policy uptake and implementation status is needed to identify  
4  
5 404 country support gaps for appropriate action.  
6

7 405

8  
9 406 This review has several limitations. National HTS policies were available only for 65  
10  
11 407 countries published them between January 2015 and June 2019. There may be policies  
12  
13 408 published in this period that we have not identified. For eight countries information was  
14  
15 409 extracted from policy documents that were not directly related to HTS and may not have  
16  
17 410 information with the required level of detail. For the EMR, SEAR and WPR regions national  
18  
19 411 policies were available from only a small number of countries and thus they may not be  
20  
21 412 representative of the situation in the whole regions. In 2019 the WHO published updated  
22  
23 413 consolidated guidelines for HTS which include a new recommendation on social network-  
24  
25 414 based approaches for HIV testing and updated guidance on HIVST and counselling  
26  
27 415 messages<sup>14 21</sup>, these were not included within this review due to timelines.  
28

29 416

30 417

## 31 418 **Conclusion**

32 419

33  
34 420 This review found that the uptake of all WHO's 2015 and 2016 HTS recommendations varied  
35  
36 421 substantially. Five countries included all the recommendations relevant to their country  
37  
38 422 setting, and 63 included at least one. Uptake was particularly low for HIV self-testing,  
39  
40 423 provider-assisted referral and lay provider testing, key interventions for reaching  
41  
42 424 undiagnosed populations and for expanding access to HTS. Encouragingly the inclusion of  
43  
44 425 recommendations in the AFR and EMR was high compared to other regions. Differentiated  
45  
46 426 HTS are essential for reaching people with HIV who do not know their status and others at  
47  
48 427 high ongoing risk to facilitate linkage to prevention, treatment and care. Ongoing advocacy  
49  
50 428 and efforts are needed to support the uptake of WHO differentiated testing recommendations  
51  
52 429 in country policies as well as their implementation. The variations in the inclusion of WHO  
53  
54 430 differentiated recommendations suggest that further research is required to understand why  
55  
56 431 some countries did not include the WHO differentiated testing recommendations, and the  
57  
58 432 support countries require to include recommendations.  
59

60 433

60 434

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

435  
436  
437  
438  
439  
440  
441  
442  
443

### **Funding statement**

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors

447  
448

### **Competing interests**

None of the authors has competing interest to declare

451

### **Authors Contributions**

TK reviewed and extracted guidelines. MS, CJ, MD and VC provided substantial input and edits to the manuscript.

455

### **Author information**

Cheryl Johnson contributed to the writing, coordination and research for the WHO Consolidated Guidelines for HIV Testing Services.

459

### **Acknowledgements**

461

Funding: No funding sources

463

Disclaimer:

464

### **Ethics Approval**

465

1  
2  
3 466 No ethics approval required as the research conducted was a policy review.  
4  
5 467

6  
7 468 **Additional Files**  
8

9 469

10  
11 470 **Additional file 1: WHO guidelines for differentiated HIV testing services**

12 471 A summary of the 2015 and 2016 Consolidated Guidelines on HIV testing recommendations.  
13  
14 472

15  
16 473 **Additional file 2: Extraction tool**

17 474 Document containing extraction tool use to collect data. The document contained the  
18 475 extraction tool used to extract data. This included all countries, regions, policy document  
19 476 type, date of policy and indication of the uptake of recommendations. The document contains  
20  
21 477 further information on key findings and countries by epidemic type.  
22  
23 478  
24  
25 479  
26  
27 480  
28  
29 481  
30  
31 482  
32  
33 483  
34  
35 484  
36  
37

38 485 **List of Abbreviations**  
39  
40 486

41 487 ART – Antiretroviral Therapy , aPN – assisted Partner Notification, DSD – Differentiated  
42 488 Service Delivery , HIV – Human Immunodeficiency Virus , HIVST – HIV self-testing , HTS – HIV  
43 489 testing services , MSM – Men Who Have Sex with Men , NSP – National Strategic Plans , PITC  
44  
45 490 – Provider- initiated Testing and Counselling , SW – Sex Workers , TB – Tuberculosis , TG –  
46  
47 491 Transgender , WHO – The World Health Organisation.  
48  
49  
50  
51 492  
52  
53  
54  
55  
56  
57  
58  
59  
60



## References

1. UNAIDS. Fact Sheet 2022: UNAIDS, 2022.
2. UNAIDS. 2021 Global AIDS update: Confronting inequalities 2021 [Available from: [https://www.unaids.org/sites/default/files/media\\_asset/2021-global-aids-update\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/2021-global-aids-update_en.pdf)].
3. UNAIDS. 2025 Aids Targets: Putting people living with HIV and communities at risk at the centre 2021 [Available from: <https://aidstargets2025.unaids.org/> accessed 23 February 2022 2022].
4. UNAIDS. Fast-Track strategy to end the AIDS epidemic by 2030: UNAIDS, 2014.
5. WHO. Progress report on HIV, viral hepatitis and sexually transmitted infections, 2019 Accountability for the global health sector strategies, 2016–2021. Geneva, Switzerland: WHO, 2019.
6. WHO. Consolidated guidelines on HIV testing services. Geneva: WHO, 2015:1-188.
7. Qiao S, Zhang Y, Li X, et al. Facilitators and barriers for HIV-testing in Zambia: A systematic review of multi-level factors. *PLoS ONE* 2018;13(2):e0192327. doi: 10.1371/journal.pone.0192327.
8. Huong NTT, Hau NT, Chau NV, et al. Perceived barriers and facilitators to uptake of HIV testing services among people who inject drugs in Vietnam. *Journal of Substance Use* 2018;23(6):551-56. doi: 10.1080/14659891.2018.1448473
9. Surratt HL, O'Grady CL, Kurtz SP, et al. HIV Testing and Engagement in Care among Highly Vulnerable Female Sex Workers: Implications for Treatment as Prevention Models. *Journal of Health Care for the Poor and Underserved* 2014;25(3):1360-78. doi: 10.1353/hpu.2014.0113.
10. Staveteig SSWHKS, S.E.K Nybro, E. Demographic patterns of HIV Testing Uptake in Sub-Saharan Africa. DHS Comparative Reports. Calverton, Maryland, USA: ICF International, 2013.
11. Traversy GP, Austin T, Timmerman K, et al. An overview of recent evidence on barriers and facilitators to HIV testing. *Canada Communicable Disease Report* 2015;41(12):302-21. doi: 10.14745/ccdr.v41i12a02

- 1  
2  
3 518 12. Loos J, Manirankunda L, Hendrickx K, et al. HIV Testing in Primary Care: Feasibility and  
4  
5 519 Acceptability of Provider initiated HIV Testing and Counseling for Sub-Saharan African Migrants. *AIDS*  
6  
7 520 *Education and Prevention* 2014;26(1):81-93. doi: <https://doi.org/10.1371/journal.pmed.1001650>  
8  
9  
10 521 13. WHO. Consolidated guidelines on HIV testing services for a changing epidemic. Geneva,  
11  
12 522 Switzerland: WHO, 2019:0-12.  
13  
14 523 14. WHO. WHO recommends social-network based HIV testing approaches for key populations as  
15  
16 524 part of partner services package. In: WHO, ed. Geneva, Switzerland, 2019.  
17  
18 525 15. IAS. Differentiated service delivery for HIV: A decision Framework for HIV testing services. It's  
19  
20 526 time to test differently. Geneva, Switzerland: International Aids Society, 2018:1-68.  
21  
22 527 16. UNAIDS. Global AIDS Monitoring 2020: Indicators for monitoring the 2016 Political Declaration  
23  
24 528 on Ending AIDS. Global AIDS Monitoring. Geneva, Switzerland: UNAIDS, 2020.  
25  
26 529 17. WHO. WHO national policy repository. 2015 ed. Dropbox: WHO, 2020.  
27  
28 530 18. WHO. *Consolidated ARV Guidelines*. Geneva, Switzerland: WHO, 2013.  
29  
30 531 19. Zhang C, Xianhong L, Brecht M-L, et al. Can self-testing increase HIV testing among men who  
31  
32 532 have sex with men: A systematic review and meta-analysis. *PLoS ONE* 2017;12(11):e0188890. doi:  
33  
34 533 [doi.org/10.1371/journal.pone.0188890](https://doi.org/10.1371/journal.pone.0188890)  
35  
36 534 20. Qin Y, Han L, Babbitt A, et al. Experiences using and organizing HIV self-testing. *Aids*  
37  
38 535 2018;32(3):371-81. doi: 10.1097/qad.0000000000001705 [published Online First: 2017/12/02]  
39  
40 536 21. WHO. Guidelines on HIV Self-testing and Partner notification: supplement to consolidated  
41  
42 537 guidelines on HIV testing services. Geneva, Switzerland: WHO, 2016.  
43  
44  
45  
46  
47  
48  
49 538  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

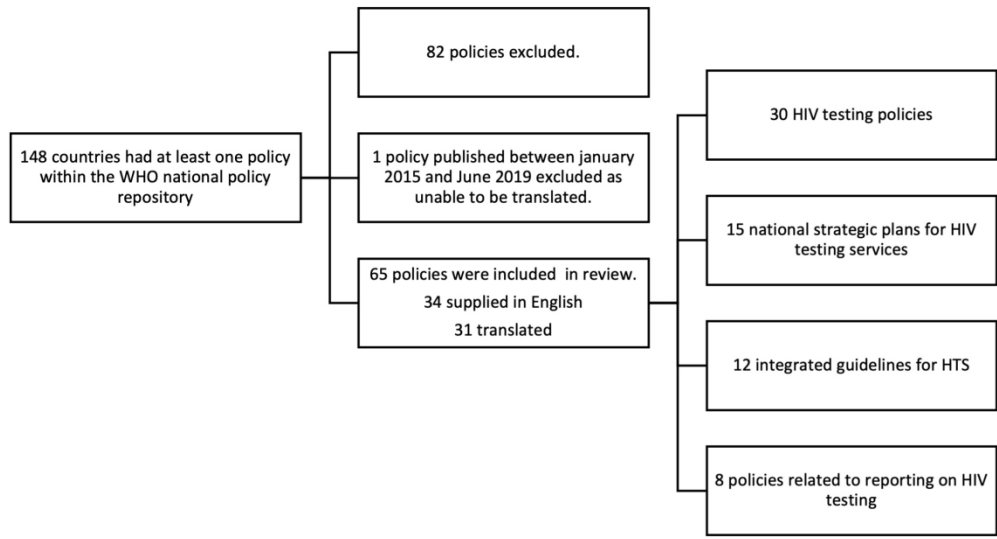


Figure 1. Process to identify country policies including recommendations on HIV testing services.

174x116mm (330 x 330 DPI)

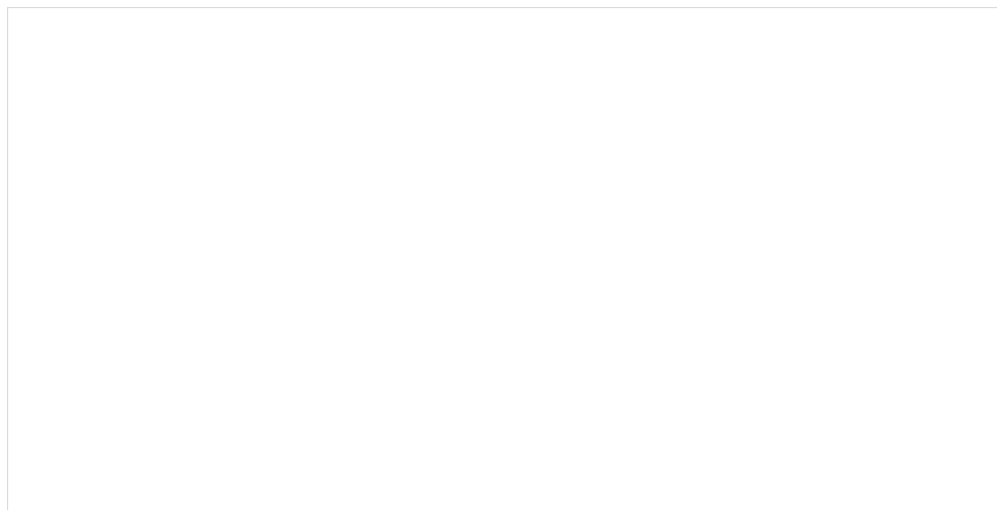


Figure 2. Countries with a national policy identified between January 2015 and June 2019. A map of all 65 countries within this review (n=65). Countries highlighted in orange are those that included all recommendations relevant to their country setting (n=5).

160x82mm (330 x 330 DPI)

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

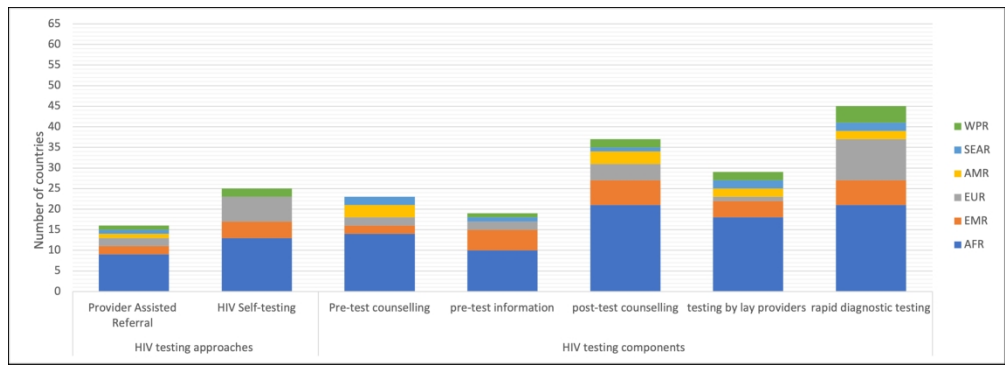


Figure 3. Number of countries that included recommendations valid in all settings and populations from the 2015 WHO consolidated guidelines for HTS, by type of recommendation and WHO region. AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region.

251x90mm (330 x 330 DPI)

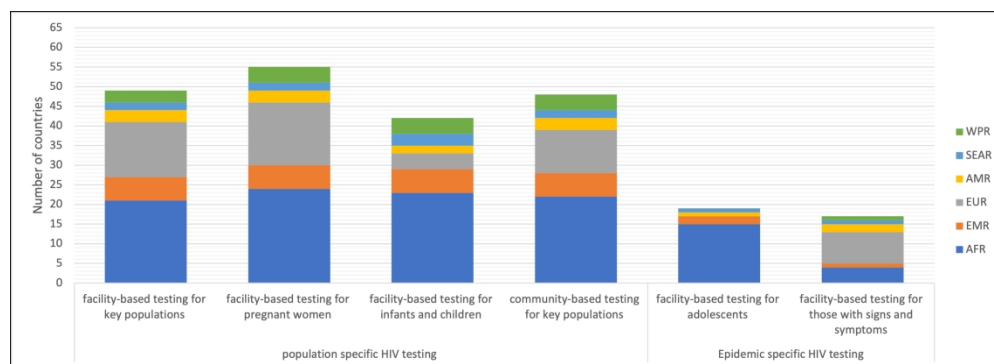


Figure 4. Number of countries included in the review that included population or epidemic specific recommendations from the 2015 WHO consolidated guidelines for HTS, by type of recommendation and WHO region. AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region. Facility-based testing for key populations here refers to provider-initiated testing and counselling this is recommended in malnutrition clinics or sexually transmitted infections (STI) or hepatitis and Tuberculosis services or health services for key populations in all settings. Facility-based testing for pregnant women, infants and children applies to all countries (n=65). Community-based testing for key populations applies to all countries (n=65). Facility-based testing for all those presenting with signs and symptoms is recommended only in countries with a concentrated epidemic (n=24); facility-based testing for adolescents only in countries with a generalised epidemics (n=22)

253x91mm (300 x 300 DPI)

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

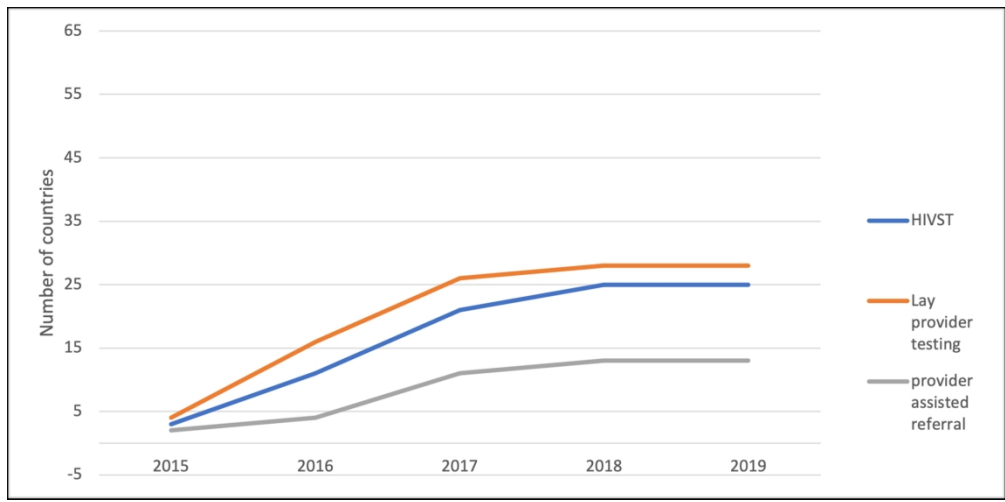


Figure 5. Number of countries including the new recommendations, by year.

176x87mm (300 x 300 DPI)

**Additional File 1: Summary of the 2015 and 2016 WHO guidelines for differentiated HIV testing services.**

<b>Box 1 WHO guidelines for differentiated HIV testing services (Source: The WHO 2015 and 2016 Consolidated guidelines on HIV testing services).</b>	
<b>HIV testing services approach</b>	
Facility-based testing (referred to a provider-initiated testing and counselling referral in the 2015 guidelines)	<p>In concentrated epidemics provider-initiated testing and counselling should be offered for clients (adults, adolescents, and children) in clinical settings who present with symptoms or medical conditions indication infection, including Tuberculosis cases.</p> <p>In all settings provider-initiated testing and counselling should be considered for malnutrition clinics, sexually transmitted infections, hepatitis and Tuberculosis services and health services for key populations.</p>
Community-based testing	<p>In generalised epidemics community-based testing should be offered to all individuals, especially key populations.</p> <p>In concentrated epidemics community-based HIV testing services is recommended for key populations.</p>
HIV Self-testing	It is strongly recommended that HIV self-testing should be offered as an additional approach to HIV testing services.
Provider assisted referral (referred to as voluntary partner notification within the 2015 recommendations)	It is strongly recommended that voluntary assisted partner notification services should be offered as part of a comprehensive package of testing and care offered to people with HIV.
<b>HIV testing services components</b>	
Pre-test information	Programmes may provide pre-test information through individual/group sessions, media and age-appropriate material when required.
Post-test counselling	Post-test counselling should be provided for all who attend testing services.
Testing by Lay Providers	It is strongly recommended that lay providers who are trained and supervised to use rapid diagnostic tests are permitted to independently conduct safe and effective HIV testing services.
<b>Population specific HIV testing</b>	



Pregnant women	<p>In high prevalence settings provider-initiated testing and counselling should be considered a routine component of antenatal clinic, childbirth, postpartum and paediatric care settings. Retesting is recommended in the third trimester, or during labour, or shortly after delivery</p> <p>In Low prevalence settings provider-initiated testing and counselling considered for all pregnant women. For pregnant women from key populations, or those with partner from key populations, HIV testing is recommended.</p>
Adolescents	In generalised epidemic HIV testing should be offered to all adolescents.
Infants and Children	In all settings HIV-exposed infants and children younger than 18 months should be tested in cases where status is unknown or uncertain.
Key Populations	It is recommended that HIV testing services are routinely recommended to key populations in community and facility-based settings.

### HTS Approaches

Facility based testing is recommended in all settings and should be considered for malnutrition clinics, sexually transmitted infections (STI), hepatitis and TB services and health services for key populations (1). Unlike voluntary testing and counselling, in facility-based testing clients are offered HIV testing with the option of 'opting out' (2). This approach to HIV testing has been shown to increase the number of people who test for HIV, one study in the USA found that 65.9% of people who were offered HIV testing accepted compared to 38% of voluntary testers (2).

In all settings community-based testing is recommended for key populations (1). Community-based testing refers to testing that is not conducted in a healthcare facility and may take different forms such as outreach testing, home-based/door-door testing (testing offered to individuals within their homes) and mobile testing (1). This has been shown to be a feasible and convenient approach to testing in some studies (3-6). Home based testing has been associated with confidentiality, credibility of tests and easily accessible counsellors, and mobile testing has been suggested to increase the number of people accessing testing services and help to overcome barriers such as long distances from clinic (7, 8).

HIVST is strongly recommended as an additional approach to HIV testing services (1). HIVST is defined as 'a process in which a person collects his or her own specimen (oral fluid or blood) and then performs an HIV test and interprets the results' (9). HIVST may increase uptake among those who never tested before by addressing barriers such as long distance transportation, long waiting times and has the potential to reduce stigmatization (10, 11). This is because HIVST can be conducted in private, or in facilities offering other services and

1  
2  
3 in populations who are at high risk, may also provide an opportunity to test more regularly  
4 (9).  
5  
6

7 Provider assisted referral (voluntary partner notification in the WHO 2015 guidelines) is a  
8 partner service which is strongly recommended (1). Partner services are defines as ‘a  
9 voluntary process whereby a trained provider asks people diagnosed with HIV about their  
10 sexual partners and/or drug injecting partners, and then, if the HIV positive clients agrees,  
11 offers there partner(s) HIV self-testing’ (9). Clients may be assisted by trained providers to  
12 disclose their status or anonymously notify sexual partners or drug injecting partners of  
13 their potential exposure to HIV, and offer HIV testing (9). This approach has been suggested  
14 to improve HIV testing services by identifying those who do not yet know their status,  
15 improving testing uptake for those who have never been tested and increase early referral  
16 to care (12-14).  
17  
18  
19

### 20 **HTS Components**

21 The 2015 consolidated guidelines recommended pre-test information instead of the  
22 previously recommended pre-test counselling(1). Previously, pre-test counselling provided  
23 comprehensive information to clients before testing to prepare clients to cope with a HIV  
24 positive diagnosis in the absence of treatment and encourage clients to return for results(1).  
25 However, the introduction of RDTs meant that individuals were now able to get results on  
26 the same day and the need for counselling before testing was no longer present and may  
27 have created barriers (1). Unlike pre-test counselling Pre-test information can be delivered  
28 in a number of formats, including to both individuals and groups, through posters,  
29 brochures, websites and short clips in waiting rooms (1). Post-test counselling is also  
30 recommended across all settings, in all HIV tests depending on the specific test result and  
31 HIV status reported (1). In order to ensure individuals are linked to the appropriate  
32 treatment and prevention services (1).  
33  
34  
35

36 Testing by trained lay providers supervised to use rapid diagnostic tests (RDTs)  
37 independently, safely and effectively (1). Testing by lay providers refers to individuals who  
38 are trained to conduct HIV tests but have no formal professional or paraprofessional  
39 certificate or tertiary education degree (1). RDT refers to a form of HIV testing that produce  
40 results quickly (usually in less than 30 minutes) enabling patients to know their result on the  
41 day in a short period of time (1). Both strategies reduce the time taken to undergo a HIV  
42 test. These components may therefore address barriers associated with time, as well as  
43 reduce the burden on resources through task shifting (15). As well as this, peer delivered  
44 testing (when lay providers are members of the same population as testers) has been shown  
45 to increase uptake, including in first time testers, and higher rates of detection of HIV cases  
46 amongst MSM and PWID in Vietnam and Thailand (16). In another study peer counsellors  
47 was identified as a facilitator for HIV testing amongst participants (3). In some populations  
48 where stigma and discrimination are present peer testing has been identified as a preferred  
49 and viable method (3, 16, 17).  
50  
51  
52  
53

### 54 **Population specific facility-based HIV testing**

55 Facility-based testing is recommended for priority populations such as pregnant women, key  
56 populations, infants and children, and adolescents (1). Diagnosing HIV as early as possible  
57 reduces mortality in infants, and in populations such as key populations and adolescents  
58  
59  
60

where testing uptake remains low differentiated testing approaches are essential in reducing barriers to testing (5, 8, 18-21).

## References.

1. WHO. Consolidated guidelines on HIV testing services. Geneva: WHO; 2015. p. 1-188.
2. Avert. HIV Testing Programmes Avert: Avert; 2019 [Available from: <https://www.avert.org/professionals/hiv-programming/testing>].
3. Woodford MR, Chakrapani V, Newman PA, Shunmugan M. Barriers and facilitators to voluntary HIV testing uptake among communities at high risk of HIV exposure in Chennai, India. *Global Public Health*. 2016;11(3):363-79.
4. Orne-Gliemann J, Zuma T, Chikocore J, Gillespie N, Grant M, Iwuji C, et al. Community perceptions of repeat HIV-testing: experiences of the ANRS 12249 Treatment as Prevention trial in rural South Africa. *AIDS Care*. 2016;28:14-23.
5. Surratt HL, O'Grady CL, Kurtz SP, Buttram ME, Levi-Minzi MA. HIV Testing and Engagement in Care among Highly Vulnerable Female Sex Workers: Implications for Treatment as Prevention Models. *Journal of Health Care for the Poor and Underserved*. 2014;25:1360-78.
6. Pharr JR, Lough NL, Ezeanolue EE. Barriers to HIV Testing Among Young Men Who Have Sex With Men (MSM): Experiences from Clark County, Nevada. *Global Journal of Health Science*. 2016;8(7).
7. Meremo A, Mboya B, Ngilangwa DP, Dulle R, Tarimo E, Urassa D, et al. Barriers to accessibility and utilization of HIV testing and counseling services in Tanzania: experience from Angaza Zaidi programme. *Pan African Medical Journal*. 2016;23(189).
8. Qiao S, Zhang Y, Li X, Menon J, Anitha. Facilitators and barriers for HIV-testing in Zambia: A systematic review of multi-level factors. *PLoS ONE*. 2018;13(2):e0192327.
9. WHO. Guidelines on HIV Self-testing and Partner notification: supplement to consolidated guidelines on HIV testing services. Geneva, Switzerland: World Health Organisation; 2016.
10. Zhang C, Xianhong L, Brecht M-L, Koniak-Griffin D. Can self-testing increase HIV testing among men who have sex with men: A systematic review and meta-analysis. *PLoS ONE*. 2017;12(11):e0188890.
11. Qin Y, Han L, Babbitt A, Walker JS, Liu F, Thirumurthy H, et al. Experiences using and organizing HIV self-testing. *AIDS*. 2018 32:371-81.
12. NAT. HIV Partner Notification: a missed opportunity. London: National AIDS Trust; 2012.
13. Dalal S, Johnson C, Fonner V, Kennedy CE, Siefried N, Figueroa C, et al. Improving HIV test uptake and case findings with assisted partner notification services. *AIDS*. 2017;31(13):1867-76.
14. Brown LB, Miller WC, Kamanga G, Nyirenda N, Mmodzi P, Pettifor A, et al. HIV Partner Notification Is Effective and Feasible in Sub-Saharan Africa: Opportunities for HIV Treatment and Prevention. *Journal of Acquired Immunodeficiency Syndrome*. 2011;56:437-42.
15. IAS. DIFFERENTIATED SERVICE DELIVERY FOR HIV: A DECISION FRAMEWORK FOR HIV TESTING SERVICES It's time to test differently.: IAS; 2018. p. 1-68.

16. Green KE, Vu BN, Huong PT, Tran MH, Ngo HV, Vo SH, et al. From conventional to disruptive: upturning the HIV testing status quo among men who have sex with men in Vietnam. 2018.
17. Ti L, Hayashi K, Kaplan K, Suwannawong P, Wood E, Montaner J, et al. Willingness to Access Peer-Delivered HIV Testing and Counseling Among People Who Inject Drugs in Bangkok, Thailand. *Journal of Community Health*. 2013;38:427-33.
18. Loos J, Manirankunda L, Hendrickx K, Remmen R, Nöstlinger C. HIV Testing in Primary Care: Feasibility and Acceptability of Provider initiated HIV Testing and Counseling for Sub-Saharan African Migrants. *AIDS Education and Prevention*. 2014;26(1):81-93.
19. Traversy GP, Austin T, Timmerman K, Gale-Rowe M. An overview of recent evidence on barriers and facilitators to HIV testing. *Canada Communicable Disease Report*. 2015;41(12).
20. DHS. Demographic patterns of HIV Testing Uptake in Sub-Saharan Africa. Calverton, Maryland, USA: ICF International; 2013.
21. Huong NTT, Hau NT, Chau NV, Tan LT, Tam NTM, Gray R, et al. Perceived barriers and facilitators to uptake of HIV testing services among people who inject drugs in Vietnam. *Journal of Substance Use*. 2018;23(6):551-6.

	Compliant
	Not complaint
	Unclear
	Concentrated epidemis
	Generalised epidemic
	Not reccomeded in this country setting

WHO region	Country	Year
AFR	Angola	2015
AMR	Argentina	2015
WPR	Australia	2017
AFR	Benin	2017
AFR	Botswana	2016
EUR	Bulgaria	2017
AFR	Cameroon	2018
EUR	Denmark	2015
WPR	China	2015
EUR	France	2017
AFR	Côte d'Ivoire	2016
EUR	Croatia	2017
AMR	Guatamala	2018
EUR	Czech Republic	2018
SEAR	India	2015
EMR	Egypt	2015
EUR	Italy	2016
EUR	Kazakhstan	2015
AFR	Ethiopia	2017
EUR	Finland	2018
AFR	Ghana	2017
EUR	Georgia	2016
EUR	Lithuania	2017
EUR	Germany	2015
AMR	Haiti	2015
AFR	Guinea	2018
AFR	Kenya	2015
EUR	Ireland	2015
AFR	Lesotho	2016
AFR	Liberia	2015
EUR	Luxembourg	2017
EUR	Netherlands	2017
AFR	Malawi	2016
WPR	Malaysia	2015
AFR	Mali	2017
EUR	Russia	2016
AFR	Mozambique	2015
SEAR	Myanmar	2017
AFR	Nigeria	2016

1			
2	EMR	Oman	2015
3	EMR	Pakistan	2017
4	EUR	Romania	2017
5	AFR	Rwanda	2016
6	AFR	Senegal	2017
7	AFR	Sierra Leone	2017
8	EUR	Slovenia	2017
9	EUR	Slovakia	2017
10	EMR	Somalia	2017
11	EUR	Sweden	2017
12	AFR	South Africa	2016
13	EMR	South Sudan	2017
14	SEAR	Sri Lanka	2016
15	AMR	Cayman Islands	2015
16	SEAR	Thailand	2017
17	EMR	Sudan	2016
18	EUR	Ukraine	2016
19	AFR	Swaziland	2018
20	AFR	Tanzania	2017
21	AFR	Uganda	2016
22	EUR	United Kingdom	2016
23	AMR	United States of America	2017
24	WPR	Vietam	2018
25	WPR	Nauru	2015
26	AFR	Zambia	2016
27	AFR	Zimbabwe	2018
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
54			
55			
56			
57			
58			
59			
60			

# Extraction Tool (Coun

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

HTS APPROCHES			
Community-based testing	provider assisted referral	HIV- self testing	Pre-test information
u	u	u	u
y	n	n	u
y	y	n	n
y	y	u	y
y	n	n	n
y	n	n	n
y	y	exploring	n
n	n	n	n
y	n	y	n
n	n	y	n
y	n	y	n
y	n	n	n
n	n	n	n
y	n	y	n
n	n	n	n
n	n	n	n
y	n	n	y
y	n	n	n
y	y	y	u
y	n	n	n
n	n	n	n
y	n	n	n
y	y	n	n
y	n	n	n
y	n	y	y
y	y	n	n
y	n	y	n
n	n	u	n
y	n	n	n
n	n	y	n
y	n	y	n
y	n	n	n
y	y	y	n
n	n	n	n
y	n	n	n
y	y	n	n
y	y	y	n
n	n	n	n
y	n	n	n
y	y	n	n
y	y	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

y	n	n	y
y	y	y	y
y	n	y	y
y	n	n	n
y	y	y	n
y	n	n	y
y	n	y	n
n	n	n	n
y	n	y	y
n	n	n	n
y	y	y	y
y	n	y	y
y	n	n	y
n	n	n	n
n	n	n	n
y	n	n	y
n	n	n	u
y	y	y	y
y	y	n	y
y	n	y	n
y	y	y	y
y	n	n	n
y	u	y	y
n	n	n	n
y	n	y	y
y	n	y	y

Review only



## try uptake of WHO recommendations on differentiate

HTS COMPONENTS			
Pre-test counselling	post-test counselling	Lay provider HIV testing	Rapid Diagnostic tests
y	u	u	y
y	y	y	y
n	n	u	y
n	y	y	y
y	y	y	y
n	n	n	n
y	y	n	u
n	n	n	n
n	y	n	y
n	n	n	y
y	y	y	y
y	y	n	y
n	n	n	n
n	n	n	y
y	y	n	n
y	y	n	y
n	n	n	n
y	y	n	n
n	y	y	y
n	n	n	n
y	y	y	y
n	n	n	n
n	n	n	y
n	n	n	n
y	y	y	y
n	n	n	y
n	n	n	y
y	y	y	y
n	n	y	y
y	y	y	n
n	n	n	n
y	y	n	y
n	n	y	y
n	n	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

n	y	n	y
n	y	y	y
n	y	n	y
y	y	y	y
y	y	n	n
n	y	y	y
n	n	n	y
n	n	n	n
n	y	y	y
n	n	n	n
n	y	y	y
y	n	y	y
y	y	n	n
n	n	n	n
y	y	y	y
u	n	n	y
n	y	y	y
n	y	y	y
y	n	y	y
n	y	y	y
n	n	n	n
n	y	y	u
n	n	n	y
n	y	y	y
n	y	u	y

Review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

### d HIV testing services approaches: a global policy review)

POPULATION SPECIFIC FACILITY BASED HIV TESTING			
Adolscents	Pregnant women	Key Populations	Infants and Children
y	y	u	y
y	y	y	n
n	y	y	y
n	y	y	y
y	y	n	y
y	y	y	u
y	y	y	y
n	n	y	n
n	y	n	y
n	y	y	n
y	y	y	y
y	y	y	n
n	y	n	y
n	y	n	n
n	n	n	y
n	y	y	y
n	y	y	y
n	y	n	n
y	y	y	y
n	y	y	u
n	n	n	n
n	n	y	n
y	y	y	y
n	y	y	y
y	y	y	y
n	y	y	n
y	y	y	y
n	y	n	y
n	y	y	n
y	y	n	n
y	y	y	y
y	y	y	y
y	y	y	y
n	n	n	n
y	y	y	y
y	y	y	y
y	y	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

n	y	y	y
y	y	y	y
y	y	y	y
y	y	y	y
n	y	y	n
y	y	y	y
n	y	y	n
n	y	y	y
y	y	y	y
n	n	n	n
y	y	y	y
y	y	y	y
y	y	y	y
n	n	n	n
n	n	n	n
n	y	y	y
n	y	n	n
y	y	y	y
y	y	y	y
y	y	y	y
n	y	y	y
n	n	y	n
n	n	y	y
n	y	n	n
y	y	y	y
y	y	y	y

Review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

EPIDEMIC SPECIFIC		
Epidemic type	Community-based testing in concentrated and generalised epidemics	Facility based testing for all adolescents in all clinical settings in generalised epidemics
c	u	
c		
c	y	
g	y	n
g	y	u
g	y	y
c	n	
c	n	
g	y	y
c	n	
c	n	
c	n	
c	y	
c	y	
c	n	
c	y	
g	y	y
g	y	y
g	y	y
g	n	n
c	n	
g	y	y
c	y	
c	y	
c	n	
g	y	y
g	y	y
g	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

c	y	
g	y	y
c	y	
g	y	y
g	y	y
g	y	y
g	y	y
c	n	
c	u	
g	y	y
g	y	y
g	y	y
c	y	
c	y	
c	y	
g	y	y
g	y	y

Review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

---

Facility based testing for those with symptoms in concentrated epidemics
u
y
y
y
y
u
y
y
y
u
y
u
y
y
y
y

For peer review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

y
y
y
u
y
y
u

For peer review only



# BMJ Open

## Country uptake of WHO recommendations on differentiated HIV testing services approaches: a global policy review

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2021-058098.R2
Article Type:	Original research
Date Submitted by the Author:	27-Feb-2023
Complete List of Authors:	Kadye, Tafadzwa; UCL, Global Health Jamil, Muhammad; World Health Organization, Johnson, Cheryl; World Health Organization, Department of HIV/AIDS Baggaley, R; World Health Organization Barr-DiChiara, Magdalena; World Health Organization, Department of Global Programmes of HIV, Hepatitis and HIV Cambiano, Valentina; UCL
<b>Primary Subject Heading</b>:	HIV/AIDS
Secondary Subject Heading:	Health policy, Infectious diseases, Sexual health
Keywords:	HIV & AIDS < INFECTIOUS DISEASES, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Public health < INFECTIOUS DISEASES

SCHOLARONE™  
Manuscripts



I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our [licence](#).

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which [Creative Commons](#) licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

1  
2  
3  
4  
5 **Target journal:** BMJ Open  
6  
7  
8  
9

10 **Title:** Country uptake of WHO recommendations on differentiated HIV testing services approaches:  
11 **a global policy review**  
12  
13

14  
15  
16 **Authors:** Tafadzwa Kadye<sup>1§</sup>, Muhammad S. Jamil<sup>2</sup>, Cheryl Johnson<sup>2</sup>, Rachel Baggaley<sup>2</sup>,  
17 Magdalena Barr-Dichiara<sup>2</sup>, Valentina Cambiano<sup>3</sup>  
18  
19

20  
21 Affiliations:  
22

- 23 1. Global HIV, Hepatitis and STIs Programme, World Health Organization, Geneva,  
24 Switzerland  
25
- 26 2. Institute for Global Health, University College London, London, UK  
27  
28  
29

30 <sup>§</sup> Corresponding author: Tafadzwa Kadye,  
31

32 Phone: 07392170704  
33

34 Email: [tafadzwa.kadye.18@ucl.ac.uk](mailto:tafadzwa.kadye.18@ucl.ac.uk); [tafkadye@gmail.com](mailto:tafkadye@gmail.com)  
35  
36  
37  
38  
39

40 TK: [tafkadye@gmail.com](mailto:tafkadye@gmail.com)

41 MSJ: [mjamil@who.int](mailto:mjamil@who.int)

42 CJ: [johnsonc@who.int](mailto:johnsonc@who.int)

43 RB: [baggaleyr@who.int](mailto:baggaleyr@who.int)

44 MBD: [barrdichiam@who.int](mailto:barrdichiam@who.int)

45 VC: [v.cambiano@ucl.ac.uk](mailto:v.cambiano@ucl.ac.uk)  
46  
47  
48  
49  
50  
51

52 **Keywords:** HIV testing; HIV self-testing; community-based testing; partner services;  
53 differentiated service delivery; key populations ;  
54  
55

56 **Word count:**

57 **Abstract:**327/300  
58

59 **Main text:** 3994/5000  
60

## 1 Abstract

2 **Objectives** In 2015 and 2016 the World Health Organization (WHO) issued guidelines on HIV  
3 testing services (HTS) highlighting recommendations for a strategic mix of differentiated HTS  
4 approaches. The policy review examines the uptake of differentiated HTS approaches  
5 recommendations in national policies.

6 **Methods** Data were extracted from national policies published between January 2015 and  
7 June 2019 . The WHO recommended HTS approaches included facility-based testing,  
8 community-based testing, HIV self-testing and provider-assisted referral (or assisted partner  
9 notification); Other supportive recommendations include pre-test information, post-test  
10 counselling, lay provider testing and rapid testing. Descriptive analyses were conducted to  
11 examine inclusion of recommendations in national policies.

12 **Results** Of 194 countries worldwide, 65 published policies were identified; 24 AFR countries  
13 (51% , 24/47), 21 EUR (40%, 21/53), 6 EMR (29%, 6/21), five AMR (14%, 5/35), five WPR  
14 (19%, 5/27) and four SEAR (36%, 4/11). Only five countries included all recommendations.  
15 63 included a minimum of one. 85% (n=55) included facility-based testing for pregnant  
16 women, 75% (n=49) facility-based testing for key populations, 74% (n=48) community-based  
17 testing for key populations, 69% (n=45) rapid testing, 57% (n=37) post-test counselling, 45%  
18 (n=29) lay provider testing, 38% (n=25) HIV self-testing, 29% (n=19) pre-test information and  
19 25% (n=16) provider-assisted referral. The proportion in each region that included at least  
20 one recommendation were: 100% AFR (24/47), 100% EMR (6/6), 100% AMR (5/5), 100%  
21 WPR (5/5), 100% SEAR (4/4) and 95% EUR (20/21). AFR followed by EMR included the  
22 highest number of recommendations.

23 **Conclusion** There was substantial variability in the uptake of WHO HTS recommendations.  
24 Those in EMR region included the most WHO differentiated HTS recommendation followed  
25 by AFR. Countries within AMR showed to include the least number of recommendations.  
26 Ongoing advocacy and efforts are need to support the uptake of WHO differentiated HTS  
27 recommendations in country policies as well as their implementation.

## 28 29 30 **Strengths and limitations of this study**

- 1  
2  
3 31 • A comprehensive review of available HIV national policies, regardless of language, was  
4 conducted.  
5 32  
6 33 • The WHO repository does not contain HIV policies for all countries worldwide, and some  
7 regions were more comprehensively represented than others.  
8 34  
9 35 • The review was limited to the 2015 WHO differentiated HTS recommendations due to the  
10 timeline in which it was written.  
11 36  
12 37 • The 2019 WHO introduced recommendations for social network based approaches were  
13 published following the review period and were therefore not included due to timelines.  
14 38  
15 39 • HTS policy uptake is often not reflective of implementation.  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## 63 Introduction

64 HIV testing services (HTS) are essential in identifying individuals who are unaware of their  
65 HIV status, linking HIV positive individuals to treatment and HIV negative individuals to  
66 prevention services. In 2021 85% of people living with HIV were aware of their HIV status<sup>1</sup>.  
67 At least 8 countries globally reported having reached the 90-90-90 targets in 2020, and in  
68 2021 UNAIDS announced new targets of 95-95-95 by 2025<sup>2-4</sup>.

69  
70 Testing uptake remains particularly low among key populations. Key populations are defined  
71 as men who have sex with men (MSM), sex workers, people who inject drugs (PWID),  
72 people in prisons and closed settings and transgender people. They make up nearly two-  
73 thirds (65%) of all new infections<sup>3 5 6</sup>. Men and young people also have low uptake and  
74 access to services<sup>7-12</sup>. In all populations with low uptake, particularly key populations,  
75 identified barriers to testing include stigma and discrimination. Structural barriers including  
76 accessibility of services, inconvenient clinic hours and opportunity costs for clients have also  
77 been identified amongst all populations<sup>7-12</sup>.

78  
79 In 2015 the World Health Organization (WHO) published the first consolidated guidelines on  
80 HTS, followed by supplementary guidance recommending HIV self-testing (HIVST) and  
81 provider-assisted referral (also referred to as “assisted partner notification”) in 2016<sup>6</sup>. In  
82 2019 the WHO published updated consolidated guidelines for HTS which include a new  
83 recommendation on social network-based approaches for HIV testing and updated guidance  
84 on HIVST and counselling message<sup>13 14</sup>. WHO guidelines encourage a strategic mix of  
85 differentiated HTS approaches with a focus on priority populations and people with HIV who  
86 do not know their status and areas with greatest gaps<sup>6 13</sup>. Differentiated HTS approaches  
87 refer to tailored and ‘client-centred’ approaches and they address barriers individuals have  
88 in accessing HTS<sup>15</sup>. The guidelines include recommendations for HTS approaches and HTS  
89 components taking into account the population, epidemic and context. See supplementary  
90 information (additional file 1) for a summary of the 2015 and 2016 WHO guidelines on HTS.

91  
92 It is important to monitor the uptake of these recommendations into country policies in  
93 order to promote the inclusion of WHO recommendations into those countries and

1  
2  
3 94 prioritize support. In doing so supporting countries to improve the uptake of HTS, and  
4  
5 95 achieve the Global 95-95-95 goals. Global monitoring of WHO guidelines uptake in national  
6  
7 96 policies is routinely undertaken as part of Global AIDS Monitoring system<sup>16</sup>. However an in-  
8  
9 97 depth understanding of adoption of WHO HTS guidelines at national level and in varying  
10  
11 98 epidemic contexts is lacking. Understanding this will enable a better knowledge of where  
12  
13 99 gaps in service may exist, and where further support may be provided to countries. To this  
14  
15 100 end, we reviewed national HTS policies to examine the uptake of 2015 WHO HTS  
16  
17 101 recommendations on differentiated testing services.  
18  
19 102

## 103 **Methods**

### 104 105 **Search strategy**

106  
107 A comprehensive search of national HTS policy documents was undertaken using the  
108 existing [WHO national policy repository](#)<sup>17</sup>. The repository was first produced in 2015 and is  
109 routinely updated by WHO staff using a AIDSFree HTS policy database, Country by country  
110 search of IAPAC/HIV Policy Watch website and a broad Google search . The google search  
111 using the following key words:

- 112 • country name AND “HIV testing” AND policy
- 113 • country name AND “HIV testing” AND guideline
- 114 • country name AND PrEP AND policy
- 115 • country name AND PrEP AND guideline
- 116 • country name AND “pre-exposure prophylaxis” AND policy
- 117 • country name AND “pre-exposure prophylaxis” AND guideline The policy repository is  
118 maintained by WHO.

119 The repository includes national policies relating to HTS, HIV counselling services,  
120 prevention services, antiretroviral therapy (ART), as well as policies relating to prevention of  
121 mother-to-child transmission, HIV partner services, national HTS action/strategic plans, and  
122 differentiated service delivery. In addition, national policies relating to sexual health, and  
123 sexually transmitted infections were also included. All available national policies were used  
124 for data extraction.  
125

1  
2  
3 126 For inclusion, national policies needed to include HTS and be published between January  
4 127 2015, after the release of the 2015 WHO consolidated guidelines, and June 2019. The most  
5 128 recent available policy document containing information on HTS was used for extraction.  
6  
7  
8  
9

10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22

130 The national policies included were reviewed against WHO recommendations published in  
131 2015/2016. Given the review end date of June 2019 the WHO 2019 guidelines were not  
132 included as they were published in December 2019. Policies in languages other than English  
133 were translated using google translate. One country gave policy documents in formats that  
134 did not permit translation and was therefore excluded. Please see further details on the  
135 process to identify country policies including HTS recommendations in Figure 1.  
136

23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44

### 137 **Data extraction**

138 Data was extracted by one author (TK) into an Excel spreadsheet. The HTS approaches  
139 considered are: (1) facility-based testing for pregnant women (1a), adolescents (1b), infants  
140 and children (1c), and key populations (1c); (2) community-based testing, including  
141 community-based testing for specific populations; (3) HIV self-testing and (4) provider-  
142 assisted referral. Additional supportive HTS recommendations considered were: (5) pre-test  
143 information, (6) post-test counselling, (7) lay provider testing and (8) rapid testing. In the  
144 2015 guidelines pre-test information was recommended instead of pre-test counselling,  
145 however data for pre-test counselling was extracted to better understand if countries were  
146 still recommending this component. The 2015 WHO consolidated guidelines and 2016  
147 Guidelines on HIV Self-testing and Partner notification were used.  
148

45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

### 149 **Data analysis and reporting**

150

151 We estimated the number and proportion of countries in each WHO region that had a  
152 relevant policy in the period of review (76%: 148/194). This was done overall (worldwide)  
153 and stratified by WHO region and epidemic type defined by generalised ( $\geq 5\%$  HIV  
154 prevalence) and concentrated ( $< 5\%$  HIV prevalence) epidemics (now often referred to as  
155 high or low burden settings). This last stratification was included because some  
156 recommendations were epidemic type specific: in particular routine facility-based testing  
157 for those with signs and symptoms, adults, adolescents and children apply only to



1  
2  
3 158 concentrated epidemics and community-based testing for adolescents apply to both  
4  
5 159 generalised epidemics. The 2015 WHO consolidated guidelines define a concentrated  
6  
7 160 epidemic as ‘HIV has spread rapidly in a defined subpopulation (such as men who have sex  
8  
9 161 with men, sex workers, transgender people, people who use drugs or people in prison or  
10  
11 162 other closed settings) but is not well established in the general population’<sup>6</sup>. A generalised is  
12  
13 163 defined as ‘HIV is firmly established in the general population. Although subpopulations at  
14  
15 164 high risk may contribute disproportionately to the spread of HIV, sexual networking in the  
16  
17 165 general population is sufficient to sustain the epidemic’<sup>18</sup>.

18 166 ‘  
19  
20 167 Policies were categorised in three groups:

- 21 168
- 22 169 • Included: Policies that clearly and explicitly stated and included a specific  
23 recommendation
  - 24 170 • Not included: Policies that did not include a specific recommendation
  - 25 171 • Unclear: Policies in which it was unclear whether a WHO recommendation was  
26 included due to insufficient information.
- 27 172

28  
29 173 Analyses were conducted in Microsoft Excel.  
30  
31 174  
32  
33 175

## 34 176 **Patient and Public Involvement**

35 177 There is no Patient and Public involved in your study.  
36  
37 178  
38  
39 179

## 40 180 **Results**

### 41 181 **Characteristics of included policies**

42 182  
43 183 Of the 194 WHO member states 148 countries had at least one policy within the WHO  
44 184 national policy repository. Of these, 65 country policies were eligible to be included; 30  
45 185 were HIV testing policies, 15 national strategic plans, 12 integrated guidelines for HTS, eight  
46 186 were related policies reporting on HIV testing (one HIV counselling policies, one ART policy,  
47 187 one integrated guidelines for STIs, one sexual health national strategic plan, one policy on  
48 188 HIV contact management, one global AIDS progress report, one differentiated testing  
49 189 guideline and one policy on community-based testing). Overall, 34 (52%) country policies

1  
2  
3 190 were in English. 82 country policies were excluded because they were published before  
4  
5 191 January 2015. Morocco's latest policy documents (written in French) were in formats that  
6  
7 192 did not permit translation. No other policies were available for Morocco in the timeframe of  
8  
9 193 interest; therefore, we could not include Morocco.

10 194

11  
12 195 *Figure 1.* Process to identify country policies including recommendations on HIV testing services. 82 country  
13  
14 196 policies were excluded as they were published before January 2015.

15 197

16  
17 198 Of the 65 country policies reviewed, 24 were from AFR (51% of 47 countries), 21 from the  
18  
19 199 WHO European region (EUR; 40% of 53 countries), six from the WHO Eastern Mediterranean  
20  
21 200 region (EMR; 29% of 21 countries), five from the Pan American region (AMR; 14% of 35  
22  
23 201 countries), five from the Western Pacific Region (WPR; 19% of 27 countries) and four from  
24  
25 202 the WHO South East Asia Region (SEAR; 36% of 11 countries). Just over two-thirds (37%,  
26  
27 203 24/65) policies were from countries classified as having a concentrated epidemic, 34%  
28  
29 204 (22/65) from a generalised epidemic.

30 205

31 206

32 207

33  
34 208 *Figure 2.* Countries with a national policy identified between January 2015 and June 2019. A map of all 65  
35 209 countries within this review (n=65). Countries highlighted in orange are those that included all  
36 210 recommendations relevant to their country setting (n=5).

37 211

### 38 212 **Overall uptake of WHO HTS recommendations in national policies**

39  
40 213 Only five country policies included all the relevant recommendations (see Figure 2). Among  
41  
42 214 the recommendations on approaches, and components, applicable to all settings and  
43  
44 215 populations (Figure 3); 69% (45/65) included rapid testing, 45% (29/65) permitted lay  
45  
46 216 provider testing, 38% (25/65) of countries supported HIVST, 35% (23/65) included pre-test  
47  
48 217 counselling and did not specify the use of pre-test information, 35% included (37/65) post-  
49  
50 218 test counselling, 29% (19/65) included pre-test information and 25% (16/65) supported  
51  
52 219 provider-assisted referral.

53 220

54  
55 221 Regarding recommendation for specific sub-populations (Figure 4 on the left); 85% (55/65)  
56  
57 222 included recommendations for testing for pregnant women, 75% (49/65) recommended  
58  
59 223 testing for key populations, 71% (17/24) recommended facility-based testing for all those

1  
2  
3 224 presenting with signs and symptoms, 74% (48/65) recommended community-based testing  
4  
5 225 for key populations and 65% (42/65) recommended facility-based testing for infants and  
6  
7 226 children. Of countries with a concentrated epidemic (n=24), 71% (17/24) recommended  
8  
9 227 facility-based testing for all those presenting with signs and symptoms. Of those with a  
10  
11 228 generalised epidemic (n=22), 86% (19/22) recommended facility-based testing for  
12  
13 229 adolescents.

14 230  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

For peer review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46

234

235 **Figure 3. Number of countries that included recommendations valid in all settings and populations from the 2015 WHO consolidated guidelines for HTS,**  
236 **by type of recommendation and WHO region.**

237 AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region.

238

239

240

241

242

243 **Figure 4 f Number of countries included in the review that included population or epidemic specific recommendations from the 2015 WHO consolidated**  
244 **guidelines for HTS, by type of recommendation and WHO region.**

245 AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region;  
246 Facility-based testing for key populations here refers to provider-initiated testing and counselling this is recommended in malnutrition clinics or sexually transmitted infections (STI) or hepatitis and Tuberculosis  
247 services or health services for key populations in all settings. Facility-based testing for pregnant women, infants and children applies to all countries (n=65). Community-based testing for key populations applies to all  
248 countries (n=65).

249 Facility-based testing for all those presenting with signs and symptoms is recommended only in countries with a concentrated epidemic (n=24); facility-based testing for adolescents only in countries with a  
250 generalised epidemics (n=22).

## 252 **Uptake of WHO recommended HTS approaches by WHO region**

253 The uptake of recommendations varied across countries (see uptake of single  
254 recommendations for each country in additional file 2) and regions. HIVST was  
255 recommended by 38% (25/65) of countries. The inclusion of HIVST ranged from EMR (67%;  
256 4/6), AFR (54%; 13/24), WPR (40%; 2/5) and EUR (29%; 6/21). No included countries from  
257 SEAR and AMR supported HIVST at the time of review.

258  
259 Only 25% (13/65) of countries included recommendations for provider-assisted referral:  
260 38% of AFR (9/24) countries, 33% of EMR (2/6), 20% (1/5) of AMR, 10% (2/21) of EUR, , 5%  
261 (1/4) of SEAR and in 5% (1/5) of WPR.

262  
263 Pre-test information was included in 29% (19/65) of country policies. The inclusion of pre-  
264 test information ranged from EMR (83%; 5/6), followed by the AFR (42%; 10/24), WPR (20%;  
265 1/5), SEAR (25%; 1/4) and EUR (10%; 2/21). No countries from AMR included this  
266 recommendation at the time of the review.

267  
268 Overall 57% (37/65) of country policies recommended post-test counselling, with variation  
269 across regions (100% EMR, 88% AFR, 40% WPR, 25% AMR, 25% SEAR, and 19% EUR). Whilst  
270 pre-test counselling is no longer recommended by WHO, it was still included by 35% (23/65)  
271 of countries: (60% AMR, 58% AFR, 50% SEAR, 33% EMR and 10% EUR) while no countries in  
272 the WPR included this recommendation.

273  
274 Rapid testing was included in 69% (45/65) of country policies, with regional variation (100%  
275 EMR, 88% AFR, 80% WPR, 50% SEAR, 48% EUR and 40% AMR). Lay provider testing was  
276 permitted in 45% (29/65) of countries (75% AFR, 67% EMR, 50% SEAR, 40% WPR, 20% AMR,  
277 and 5% EUR).

281 *Figure 5. Number of countries including the new recommendations, by year.*

1  
2  
3 283  
4 284 Lay Provider testing was recommended for the first time by WHO in 2015 and provider-  
5  
6 285 assisted referral and HIVST in 2016. Figure 5 shows the number of countries including the  
7  
8 286 new recommendations in their policies in the years following their introduction. A steep  
9  
10 287 increase in uptake can be observed with 16, 25 and 29 countries including recommendation  
11  
12 288 on respectively provider-assisted referral, HIVST and lay provider testing by June 2019.

13 289

14 290

### 17 291 **Uptake of population specific HTS approaches by WHO region**

18  
19 292 Facility-based testing for pregnant women was recommended by 85% (55/65) of countries,  
20  
21 293 including all countries in EMR (100%; 6/6) and AFR (100%; 24/24) followed by WPR (80%;  
22  
23 294 4/5), EUR (76%; 16/21), AMR (60%;3/5) and SEAR (50%;2/4). Nearly two-thirds of countries  
24  
25 295 (65%, 42/65) of countries recommended facility-based testing for infants and children  
26  
27 296 (100% EMR, 76% AFR, 80% WPR, 75% SEAR, 40% AMR and 19% EUR).

28 297

29  
30 298 Facility-based testing for key populations is recommended in 49 countries (100% EMR, 88%  
31  
32 299 AFR, 67% EUR, 60% AMR, 60% WPR and 50% SEAR). Of the countries that recommended  
33  
34 300 facility-based testing for key populations, 69% (34/49) recommended targeted testing for  
35  
36 301 MSM, 59% (29/49) for sex workers or those who engage in transactional sex, 57% (28/49)  
37  
38 302 for PWID, 45% (22/49) for prisoners and 18% (9/49) for transgender people. Inclusion  
39  
40 303 ranged with countries from the EMR starting from 100% (6/6) uptake, as well as AFR (88%;  
41  
42 304 21/24), the EUR (66%;14/21) and WPR (60%; 3/5), while it was lower in the AMR (60%; 3/5)  
43  
44 305 and the SEAR (50%; 2/4).

45 306

46  
47 307 Nearly three-quarters (74%, 48/65) of countries recommended community-based testing for  
48  
49 308 key-populations. Uptake of community-based testing varied by region (100% EMR, 88% AFR,  
50  
51 309 80% WPR, 52% EUR, 50% SEAR and 20% AMR). Of the countries that included community-  
52  
53 310 based testing for key populations; 44% (21/48) home-based/door-door testing, 38% (18/48)  
54  
55 311 included outreach services, 35% (17/48) workplace testing, 35% (17/48) mobile testing, 23%  
56  
57 312 (11/48) testing within educational establishments, 15% (7/48) testing in places of worship  
58  
59 313 and 13% (6/48) recommended testing in community health centres.

60 314

1  
2  
3 315 Of the countries classified as having a concentrated epidemic, 37% (n=24), 20% (5/24) were  
4 316 in the AFR region, 46% (11/24) in EURO, 12% (3/24) in AMR, 8% (2/24) in SEAR, 8% (2/24) in  
5 317 WPR and 4% (1/24) in EMR. 72% (18/24) of these countries recommended facility-based  
6 318 testing for all those presenting with signs and symptoms of HIV. 34% (n=22) of countries  
7 319 were classified as having a generalised epidemic. Amongst the countries with a generalised  
8 320 epidemic 100% (22/22) recommended routine facility-based testing for adolescents.  
9  
10  
11  
12  
13  
14  
15  
16  
17

321

322

## 323 Discussion

324 As of 2019, 81% of all people with HIV are estimated to have been diagnosed globally<sup>2</sup>.  
325 Differentiated testing approaches are critical for reaching the remaining people with HIV as  
326 standard testing services have not been successful in serving them. WHO recommends a  
327 strategic mix of HTS depending on the epidemiology, context and focus populations. The  
328 variations in uptake suggest that further research is required to understand why some  
329 countries did not include the WHO differentiated HTS recommendations, and what support  
330 countries require to include recommendations. National policies often did not elaborate  
331 how various approaches will be used within a differentiated HTS plan to reach national goals  
332 and specific service delivery models and support tools. Moreover, inclusion of  
333 recommendations in policies does not always directly lead to implementation or scale up of  
334 effective practices. Further monitoring is needed to understand the implementation status  
335 of services as well as their scale and coverage.  
336

337

338 Across all country policies reviewed, only five countries (in 3 AFR, 1 EMR and 1 EUR)  
339 included all the WHO HTS recommendations (relevant to their country setting) with gaps in  
340 uptake remaining. 63 countries included at least one recommendation. The uptake of  
341 recommendation in some country policies, although varied, does however suggest that it is  
342 feasible to adapt latest policies within a short time frame. We found high uptake of  
343 recommendations for community-based testing, first recommended in 2013<sup>19</sup>. Mobile  
344 testing, outreach testing, self-testing and provider-assisted referral were the approaches  
345 with the lowest uptake. As mentioned, the first two were more recently recommended so  
they might partly explain the lower uptake. For the latter two (mobile testing and outreach

1  
2  
3 346 testing), the lower uptake might reflect the fact that they require more resources to  
4  
5 347 introduce them and that they are more difficult to integrate. Population specific facility-  
6  
7 348 based testing recommendations were generally taken up for pregnant women and, infants  
8  
9 349 and children and key populations. Among countries with generalised and concentrated  
10  
11 350 epidemics, there was high uptake of community-based testing for key populations; while,  
12  
13 351 only half of countries recommended mobile testing explicitly, and just over two fifths  
14  
15 352 recommended outreach testing.

16 353

17  
18 354 These methods are likely to increase the uptake of HIV testing for key populations, by  
19  
20 355 reducing barriers to access to HIV testing services. For example the 2016 WHO Guidelines on  
21  
22 356 HIVST and Partner Notification pointed out that these two approaches were perceived to  
23  
24 357 reduce stigma amongst MSM and female sex workers<sup>20</sup>. Stigma and discrimination have  
25  
26 358 been found to be associated with never testing<sup>21,22</sup>. In particular, studies have shown people  
27  
28 359 might fear to be perceived as promiscuous, to be sexually rejected, socially distanced or  
29  
30 360 even rejected by friends and family members if found to be living with HIV<sup>23 24</sup>. Stigma has  
31  
32 361 also been associated with feelings of worthlessness and shame<sup>24</sup>. Women with greater  
33  
34 362 perceived stigma have been shown to be less likely to test with gender inequality being  
35  
36 363 associated with stigmatising attitudes, and in some studies healthcare workers identify  
37  
38 364 stigma as a barrier to testing<sup>25 26</sup>.

39 365

40 366 Both HIVST and provider assisted referral have been found to be acceptable and feasible to  
41  
42 367 implement, and in reaching people who would not otherwise have tested for HIV<sup>27 28</sup>. A  
43  
44 368 steady increase in the number of countries adopting these recommendations within  
45  
46 369 national policies has been observed. According to latest Global AIDS Monitoring, as of 2021  
47  
48 370 94 countries globally report inclusion of HIVST in national policies and 48 of them are  
49  
50 371 routinely implementing HIVST<sup>2</sup>.

51 372

52  
53 373 Since 2015, WHO has recommended a brief pre-test information when offering HTS instead  
54  
55 374 of detailed pre-test counseling. Evidence and programmatic experiences suggest lengthy  
56  
57 375 pre-test counselling is no longer needed and may in fact deter some testers from seeking  
58  
59 376 HTS, such as repeat testers. Our review shows many countries may still be continuing to  
60  
377 include traditional pre-test counselling within their national policies. Traditional pre-test



1  
2  
3 378 counselling reduces the efficiency of HTS and does not represent the best use of scarce  
4  
5 379 human and financial resources <sup>6</sup>. Anecdotal evidence suggests many countries provide post-  
6  
7 380 test counselling that includes outdated information. For example, many programmes had  
8  
9 381 not adapted counselling messages to include information of prevention benefits of  
10  
11 382 treatment and achieving viral suppression for partners (undetectable=untransmissible or  
12  
13 383 U=U), availability of effective prevention options such as pre-exposure prophylaxis (PrEP)  
14  
15 384 and messages on optimal testing frequency based on risk and epidemiology. Countries need  
16  
17 385 to review and revise their policies to adopt latest WHO recommendation on pre-test  
18  
19 386 information and post-test counselling.  
20  
21 387

22 388 Over two thirds of countries included in this review support the use of rapid HIV testing,  
23  
24 389 which can provide same day diagnosis, facilitating rapid initiation of ART. WHO recommends  
25  
26 390 the use of trained lay providers and peers for delivering HTS using RDTs. However, of the  
27  
28 391 countries that included RDT in their policies, few included the use of lay providers. Lay  
29  
30 392 providers can affect expansion of services by enabling testing at places accessible and  
31  
32 393 convenient to populations or groups most affected with HIV . This includes the introduction  
33  
34 394 and scale up of community-based testing. Countries need to review their policies to address  
35  
36 395 legal barriers to use of trained lay providers and develop standard operating procedures and  
37  
38 396 training material and supervision activities for this cadre of providers.  
39  
40 397

41 398 Our review found variations in policy uptake by region. Overall countries in EMR region  
42  
43 399 showed the highest uptake followed by AFR countries, while uptake in other regions  
44  
45 400 remained comparatively low. For the AFR region, these findings are expected as well as  
46  
47 401 encouraging as this region represents the highest burden of HIV infection<sup>2</sup>. We also had a  
48  
49 402 greater coverage of policies included (51% of all countries in the region) better  
50  
51 403 representation of countries compared to other regions. WHO and other international  
52  
53 404 agencies and donors make concerted efforts to support the HIV response in AFR which may  
54  
55 405 be reflected in greater uptake of WHO recommendations. Typically countries in this region  
56  
57 406 also rely on WHO guidelines to inform national policies in contrast to some other regions  
58  
59 407 such as AMR, EUR, WPR which are more likely to based policy decisions on national  
60  
408 guidance. These findings need to be interpreted with caution for regions other than AFR,  
409 partly due to low coverage of policies included (ranging 14-40%), thus may not be

1  
2  
3 410 representative of the country approaches . The epidemic context also varies in other  
4  
5 411 regions, epidemics focused among key populations may face the presence of stigma and  
6  
7 412 discrimination, and varied implementation should also be considered. Further efforts  
8  
9 413 focused on these regions and engagement with countries may be needed to improve  
10  
11 414 uptake.

12 415

14 416 Overall, our review findings suggest that regular monitoring and better understanding of  
15  
16 417 country uptake of WHO recommendations is needed to address country support needs to  
17  
18 418 address such gaps. It is important to consider that inclusion of recommendations in national  
19  
20 419 policies does not necessarily reflect that they are implemented and often there is a gap  
21  
22 420 between policy uptake and implementation. Efforts are needed to enhance country policy  
23  
24 421 uptake and minimize the lag in implementation. It is also important to note that whilst this  
25  
26 422 review focuses on the inclusion of recommendation from the 2015 WHO consolidated  
27  
28 423 guidelines, national HTS policies were already in existence before this date. All stakeholders  
29  
30 424 including international organizations, implementing partners, and donors need to support  
31  
32 425 the governments and national programmes in updating national policies and translating  
33  
34 426 these into implementation. Community groups and civil society need to advocate for  
35  
36 427 availability of latest and evidence-based recommendations and interventions in their  
37  
38 428 countries. Further support may be needed in operationalization and scale up of such  
39  
40 429 policies, and strategies focusing on key populations are required in some settings. Regular  
41  
42 430 monitoring of country policy uptake and implementation status is needed to identify  
43  
44 431 country support gaps for appropriate action.

45 432

46 433 This review has several limitations. National HTS policies were available only for 65  
47  
48 434 countries published them between January 2015 and June 2019. There may be policies  
49  
50 435 published in this period that we have not identified. For eight countries information was  
51  
52 436 extracted from policy documents that were not directly related to HTS and may not have  
53  
54 437 information with the required level of detail. For the EMR, SEAR and WPR regions national  
55  
56 438 policies were available from only a small number of countries and thus they may not be  
57  
58 439 representative of the situation in the whole regions. In 2019 the WHO published updated  
59  
60 440 consolidated guidelines for HTS which include a new recommendation on social network-

1  
2  
3 441 based approaches for HIV testing and updated guidance on HIVST and counselling  
4  
5 442 messages<sup>14 20</sup>, these were not included within this review due to timelines.  
6  
7 443  
8  
9 444

## 10 445 **Conclusion**

11 446  
12  
13 447 This review found that the uptake of all WHO's 2015 and 2016 HTS recommendations varied  
14  
15 substantially. Five countries included all the recommendations relevant to their country  
16 448 setting, and 63 included at least one. Uptake was particularly low for HIV self-testing,  
17 449 provider-assisted referral and lay provider testing, key interventions for reaching  
18 450 undiagnosed populations and for expanding access to HTS. Encouragingly the inclusion of  
19 451 recommendations in the AFR and EMR was high compared to other regions. Differentiated  
20 452 HTS are essential for reaching people with HIV who do not know their status and others at  
21 453 high ongoing risk to facilitate linkage to prevention, treatment and care. Ongoing advocacy  
22 454 and efforts are need to support the uptake of WHO differentiated testing recommendations  
23 455 in country policies as well as their implementation. The variations in the inclusion of WHO  
24 456 differentiated recommendations suggest that further research is required to understand why  
25 457 some countries did not include the WHO differentiated testing recommendations, and the  
26 458 support countries require to include recommendations.  
27 459  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## 465 **Funding statement**

466 This research received no specific grant from any funding agency in the public, commercial  
467 or not-for-profit sectors  
468

## 470 **Competing interests**

471 None of the authors has competing interest to declare  
472

## 473 **Authors Contributions**

474 TK took overall responsibility for the review of the policies. MS, CJ and MD were responsible  
475 for creating the WHO's global policy repository and keeping it up to date. TK, CJ, VC , RB  
476 were involved in the development of the protocol and of the data extraction tool and in  
477 designing the analysis. TK screened the policies, extracted the data, conducted the analysis  
478 and produced the first draft of the manuscript. All authors reviewed the manuscript,  
479 provided inputs and approved the final version of the manuscript.

## 481 **Author information**

482 Cheryl Johnson contributed to the writing, coordination and research for the WHO  
483 Consolidated Guidelines for HIV Testing Services.

## 485 **Acknowledgements**

487 Funding: No funding sources

488 Disclaimer:

## 490 **Ethics Approval**

491 No ethics approval required as the research conducted was a policy review.

## 494 **Data availability statement**

495 Extra data can be accessed via the Dryad data repository at <http://datadryad.org/> with the  
496 doi:10.5061/dryad.fj6q57406

## 498 **Additional Files**

### 500 **Additional file 1: WHO guidelines for differentiated HIV testing services**

501 A summary of the 2015 and 2016 Consolidated Guidelines on HIV testing recommendations.

### 503 **Additional file 2: Extraction tool**

1  
2  
3 504 Document containing extraction tool use to collect data. The document contained the  
4  
5 505 extraction tool used to extract data. This included all countries, regions, policy document  
6  
7 506 type, date of policy and indication of the uptake of recommendations. The document contains  
8  
9 507 further information on key findings and countries by epidemic type.

10 508

11 509

12 510

13 511

14 512

15 513

16 514

17  
18  
19  
20  
21  
22  
23 515 **List of Abbreviations**

24 516

25 517 ART – Antiretroviral Therapy , aPN – assisted Partner Notification, DSD – Differentiated

26 518 Service Delivery , HIV – Human Immunodeficiency Virus , HIVST – HIV self-testing , HTS – HIV

27 519 testing services , MSM – Men Who Have Sex with Men , NSP – National Strategic Plans , PITC

28 520 – Provider- initiated Testing and Counselling , SW – Sex Workers , TB – Tuberculosis , TG –

29 521 Transgender , WHO – The World Health Organisation.

30 522  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

523 **References**

1. UNAIDS. Fact Sheet 2022: UNAIDS, 2022.
2. UNAIDS. 2021 Global AIDS update: Confronting inequalities 2021 [Available from: [https://www.unaids.org/sites/default/files/media\\_asset/2021-global-aids-update\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/2021-global-aids-update_en.pdf)].
3. UNAIDS. 2025 Aids Targets: Putting people living with HIV and communities at risk at the centre 2021 [Available from: <https://aidstargets2025.unaids.org/> accessed 23 February 2022 2022.
4. UNAIDS. Fast-Track strategy to end the AIDS epidemic by 2030: UNAIDS, 2014.
5. WHO. Progress report on HIV, viral hepatitis and sexually transmitted infections, 2019 Accountability for the global health sector strategies, 2016–2021. Geneva, Switzerland: WHO, 2019.
6. WHO. Consolidated guidelines on HIV testing services. Geneva: WHO, 2015:1-188.
7. Qiao S, Zhang Y, Li X, et al. Facilitators and barriers for HIV-testing in Zambia: A systematic review of multi-level factors. *PLoS ONE* 2018;13(2):e0192327. doi: 10.1371/journal.pone.0192327.
8. Huong NTT, Hau NT, Chau NV, et al. Perceived barriers and facilitators to uptake of HIV testing services among people who inject drugs in Vietnam. *Journal of Substance Use* 2018;23(6):551-56. doi: 10.1080/14659891.2018.1448473
9. Surratt HL, O'Grady CL, Kurtz SP, et al. HIV Testing and Engagement in Care among Highly Vulnerable Female Sex Workers: Implications for Treatment as Prevention Models. *Journal of Health Care for the Poor and Underserved* 2014;25(3):1360-78. doi: 10.1353/hpu.2014.0113.
10. Staveteig SSWHKS, S.E.K Nybro, E. Demographic patterns of HIV Testing Uptake in Sub-Saharan Africa. DHS Comparative Reports. Calverton, Maryland, USA: ICF International, 2013.
11. Traversy GP, Austin T, Timmerman K, et al. An overview of recent evidence on barriers and facilitators to HIV testing. *Canada Communicable Disease Report* 2015;41(12):302-21. doi: 10.14745/ccdr.v41i12a02

12. Loos J, Manirankunda L, Hendrickx K, et al. HIV Testing in Primary Care: Feasibility and Acceptability of Provider initiated HIV Testing and Counseling for Sub-Saharan African Migrants. *AIDS Education and Prevention* 2014;26(1):81-93. doi: <https://doi.org/10.1371/journal.pmed.1001650>
13. WHO. Consolidated guidelines on HIV testing services for a changing epidemic. Geneva, Switzerland: WHO, 2019:0-12.
14. WHO. WHO recommends social-network based HIV testing approaches for key populations as part of partner services package. In: WHO, ed. Geneva, Switzerland, 2019.
15. IAS. Differentiated service delivery for HIV: A decision Framework for HIV testing services. It's time to test differently. Geneva, Switzerland: International Aids Society, 2018:1-68.
16. UNAIDS. Global AIDS Monitoring 2020: Indicators for monitoring the 2016 Political Declaration on Ending AIDS. Global AIDS Monitoring. Geneva, Switzerland: UNAIDS, 2020.
17. WHO. WHO national policy repository. 2015 ed. Dropbox: WHO, 2020.
18. Buse K, Hawkes S. Health post-2015: evidence and power. *The Lancet* 2014;383:678-79.
19. WHO. *Consolidated ARV Guidelines*. Geneva, Switzerland: WHO, 2013.
20. WHO. Guidelines on HIV Self-testing and Partner notification: supplement to consolidated guidelines on HIV testing services. Geneva, Switzerland: WHO, 2016.
21. Pitpitan EV, Kalichman SC, Eaton LA, et al. AIDS-related stigma, HIV testing, and transmission risk among patrons of informal drinking places in Cape Town, South Africa. *Ann Behav Med* 2012;43(3) doi: 10.1007/s12160-012-9346-9
22. Conway DP, Holt M, Couldwell DL, et al. Barriers to HIV testing and characteristics associated with never testing among gay and bisexual men attending sexual health clinics in Sydney. *Journal of the International AIDS Society* 2015;43(3) doi: 10.1007/s12160-012-9346-9
23. Bradley E. Iott, Loveluck J, Benton A, et al. The impact of stigma on HIV testing decisions for gay, bisexual, queer and other men who have sex with men: a qualitative study. *BMC Public Health* 2022;22(471) doi: <https://doi.org/10.1186/s12889-022-12761-5>

1  
2  
3 <div data-component="share-box" style="margin: 0px; box-sizing: inherit; padding: 0px; margin-  
4 block-start: 16px; color: rgb(51, 51, 51); font-family: Georgia, Palatino, serif; font-size: 18px;  
5  
6 background-color: rgb(255, 255, 255);">  
7

8  
9  
10 24. Akatukwasa CG, Monica El Ayadi, Alison M. Namanya, Judith Maeri, Irene Itiakorit, Harriet  
11  
12 Owino, Lawrence Sanyu, Naomi Kabami, Jane Ssemmondo, Emmanuel Sang, Norton Kwarisiima,  
13  
14 Dalsone Petersen, Maya L. Charlebois, Edwin D. Chamie, Gabriel Clark, Tamara D. Cohen, Craig R.  
15  
16 Kanya, Moses R. Bukusi, Elizabeth A. Havlir, Diane V. Camlin, Carol S. Dimensions of HIV-related  
17  
18 stigma in rural communities in Kenya and Uganda at the start of a large HIV 'test and treat' trial.  
19  
20 *PLoS ONE* 2021;16(5) doi: <https://doi.org/10.1371/journal.pone.0249462>  
21  
22

23  
24 25. Sullivan MC, Rosen AO, Allen A, et al. Falling Short of the First 90: HIV Stigma and HIV Testing  
25  
26 Research in the 90–90–90 Era. *AIDS and Behaviour* 2020;24:357-62. doi:  
27  
28 <https://doi.org/10.1007/s10461-019-02771-7>  
29

30  
31 26. Thapa S, Hannes K, Cargo M, et al. Stigma reduction in relation to HIV test uptake in low- and  
32  
33 middle-income countries: a realist review. *The Lancet* 2018;18(1277) doi:  
34  
35 <https://doi.org/10.1186/s12889-018-6156-4>  
36  
37  
38  
39

40  
41 <div data-component="share-box" style="margin: 0px; box-sizing: inherit; padding: 0px; margin-  
42 block-start: 16px; color: rgb(51, 51, 51); font-family: Georgia, Palatino, serif; font-size: 18px;  
43  
44 background-color: rgb(255, 255, 255);">  
45

46  
47 27. Zhang C, Xianhong L, Brecht M-L, et al. Can self-testing increase HIV testing among men who  
48  
49 have sex with men: A systematic review and meta-analysis. *PLoS ONE* 2017;12(11):e0188890. doi:  
50  
51 [doi.org/10.1371/journal.pone.0188890](https://doi.org/10.1371/journal.pone.0188890)  
52

53  
54 28. Qin Y, Han L, Babbitt A, et al. Experiences using and organizing HIV self-testing. *Aids*  
55  
56 2018;32(3):371-81. doi: 10.1097/qad.0000000000001705 [published Online First: 2017/12/02]  
57  
58  
59  
60



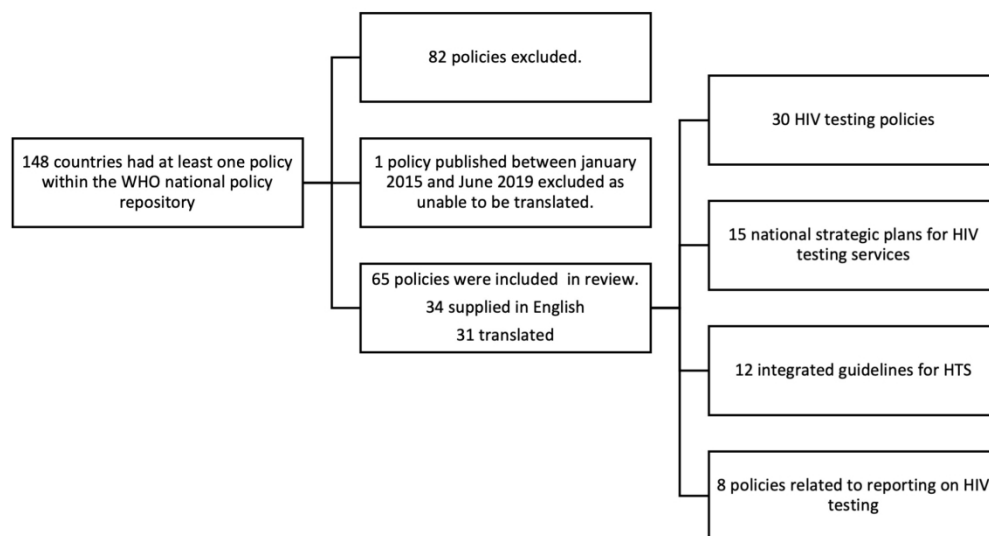
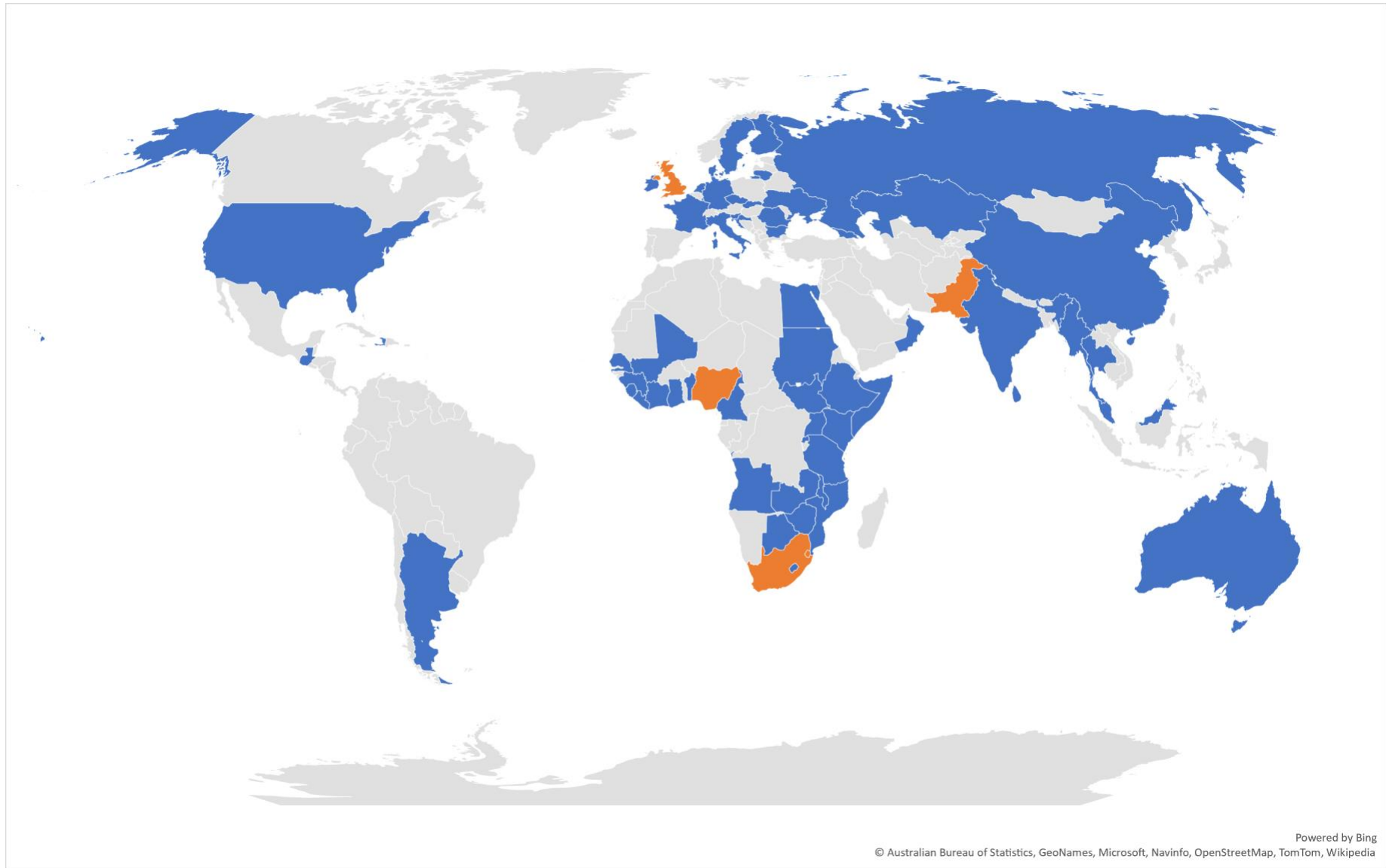


Figure 1. Process to identify country policies including recommendations on HIV testing services.

174x116mm (330 x 330 DPI)

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

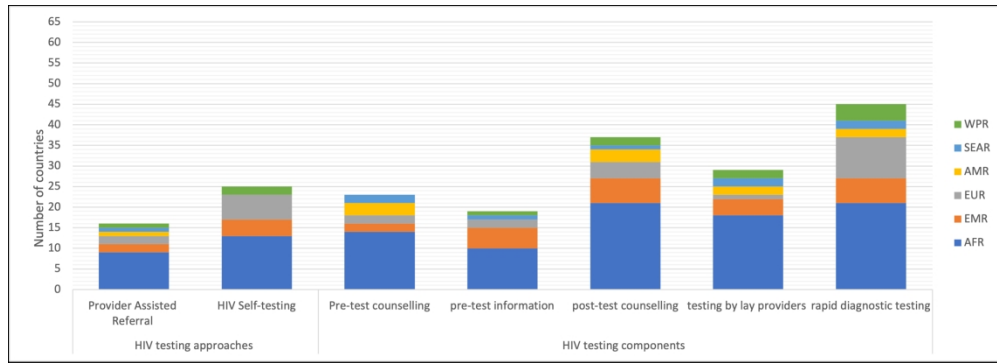


Figure 3. Number of countries that included recommendations valid in all settings and populations from the 2015 WHO consolidated guidelines for HTS, by type of recommendation and WHO region. AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region.

251x90mm (330 x 330 DPI)

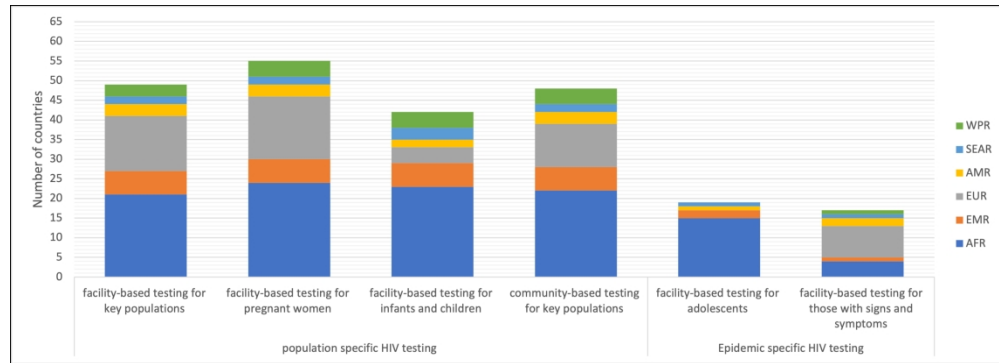


Figure 4. Number of countries included in the review that included population or epidemic specific recommendations from the 2015 WHO consolidated guidelines for HTS, by type of recommendation and WHO region. AFR: WHO Africa region; AMR: Pan American region; EMR: WHO Eastern Mediterranean region; EUR: WHO European region; SEAR: WHO South East Asia Region; WPR: Western Pacific Region. Facility-based testing for key populations here refers to provider-initiated testing and counselling this is recommended in malnutrition clinics or sexually transmitted infections (STI) or hepatitis and Tuberculosis services or health services for key populations in all settings. Facility-based testing for pregnant women, infants and children applies to all countries (n=65). Community-based testing for key populations applies to all countries (n=65). Facility-based testing for all those presenting with signs and symptoms is recommended only in countries with a concentrated epidemic (n=24); facility-based testing for adolescents only in countries with a generalised epidemics (n=22)

253x91mm (330 x 330 DPI)

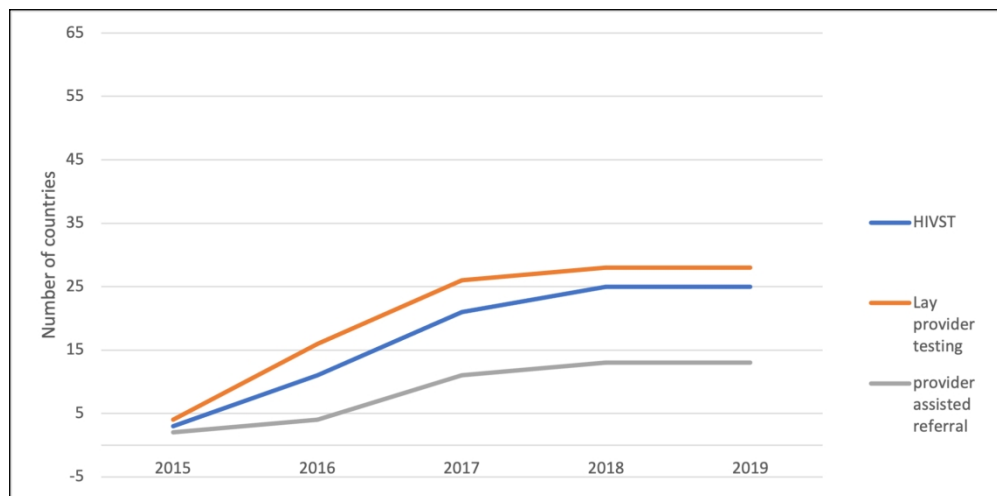


Figure 5. Number of countries including the new recommendations, by year.

177x87mm (330 x 330 DPI)

**Additional File 1: Summary of the 2015 and 2016 WHO guidelines for differentiated HIV testing services.**

<b>Box 1 WHO guidelines for differentiated HIV testing services (Source: The WHO 2015 and 2016 Consolidated guidelines on HIV testing services).</b>	
<b>HIV testing services approach</b>	
Facility-based testing (referred to a provider-initiated testing and counselling referral in the 2015 guidelines)	<p>In concentrated epidemics provider-initiated testing and counselling should be offered for clients (adults, adolescents, and children) in clinical settings who present with symptoms or medical conditions indication infection, including Tuberculosis cases.</p> <p>In all settings provider-initiated testing and counselling should be considered for malnutrition clinics, sexually transmitted infections, hepatitis and Tuberculosis services and health services for key populations.</p>
Community-based testing	<p>In generalised epidemics community-based testing should be offered to all individuals, especially key populations.</p> <p>In concentrated epidemics community-based HIV testing services is recommended for key populations.</p>
HIV Self-testing	It is strongly recommended that HIV self-testing should be offered as an additional approach to HIV testing services.
Provider assisted referral (referred to as voluntary partner notification within the 2015 recommendations)	It is strongly recommended that voluntary assisted partner notification services should be offered as part of a comprehensive package of testing and care offered to people with HIV.
<b>HIV testing services components</b>	
Pre-test information	Programmes may provide pre-test information through individual/group sessions, media and age-appropriate material when required.
Post-test counselling	Post-test counselling should be provided for all who attend testing services.
Testing by Lay Providers	It is strongly recommended that lay providers who are trained and supervised to use rapid diagnostic tests are permitted to independently conduct safe and effective HIV testing services.
<b>Population specific HIV testing</b>	

Pregnant women	<p>In high prevalence settings provider-initiated testing and counselling should be considered a routine component of antenatal clinic, childbirth, postpartum and paediatric care settings. Retesting is recommended in the third trimester, or during labour, or shortly after delivery</p> <p>In Low prevalence settings provider-initiated testing and counselling considered for all pregnant women. For pregnant women from key populations, or those with partner from key populations, HIV testing is recommended.</p>
Adolescents	In generalised epidemic HIV testing should be offered to all adolescents.
Infants and Children	In all settings HIV-exposed infants and children younger than 18 months should be tested in cases where status is unknown or uncertain.
Key Populations	It is recommended that HIV testing services are routinely recommended to key populations in community and facility-based settings.

### HTS Approaches

Facility based testing is recommended in all settings and should be considered for malnutrition clinics, sexually transmitted infections (STI), hepatitis and TB services and health services for key populations (1). Unlike voluntary testing and counselling, in facility-based testing clients are offered HIV testing with the option of 'opting out' (2). This approach to HIV testing has been shown to increase the number of people who test for HIV, one study in the USA found that 65.9% of people who were offered HIV testing accepted compared to 38% of voluntary testers (2).

In all settings community-based testing is recommended for key populations (1). Community-based testing refers to testing that is not conducted in a healthcare facility and may take different forms such as outreach testing, home-based/door-door testing (testing offered to individuals within their homes) and mobile testing (1). This has been shown to be a feasible and convenient approach to testing in some studies (3-6). Home based testing has been associated with confidentiality, credibility of tests and easily accessible counsellors, and mobile testing has been suggested to increase the number of people accessing testing services and help to overcome barriers such as long distances from clinic (7, 8).

HIVST is strongly recommended as an additional approach to HIV testing services (1). HIVST is defined as 'a process in which a person collects his or her own specimen (oral fluid or blood) and then performs an HIV test and interprets the results' (9). HIVST may increase uptake among those who never tested before by addressing barriers such as long distance transportation, long waiting times and has the potential to reduce stigmatization (10, 11). This is because HIVST can be conducted in private, or in facilities offering other services and

1  
2  
3 in populations who are at high risk, may also provide an opportunity to test more regularly  
4 (9).  
5

6  
7 Provider assisted referral (voluntary partner notification in the WHO 2015 guidelines) is a  
8 partner service which is strongly recommended (1). Partner services are defines as ‘a  
9 voluntary process whereby a trained provider asks people diagnosed with HIV about their  
10 sexual partners and/or drug injecting partners, and then, if the HIV positive clients agrees,  
11 offers there partner(s) HIV self-testing’ (9). Clients may be assisted by trained providers to  
12 disclose their status or anonymously notify sexual partners or drug injecting partners of  
13 their potential exposure to HIV, and offer HIV testing (9). This approach has been suggested  
14 to improve HIV testing services by identifying those who do not yet know their status,  
15 improving testing uptake for those who have never been tested and increase early referral  
16 to care (12-14).  
17  
18  
19

### 20 **HTS Components**

21 The 2015 consolidated guidelines recommended pre-test information instead of the  
22 previously recommended pre-test counselling(1). Previously, pre-test counselling provided  
23 comprehensive information to clients before testing to prepare clients to cope with a HIV  
24 positive diagnosis in the absence of treatment and encourage clients to return for results(1).  
25 However, the introduction of RDTs meant that individuals were now able to get results on  
26 the same day and the need for counselling before testing was no longer present and may  
27 have created barriers (1). Unlike pre-test counselling Pre-test information can be delivered  
28 in a number of formats, including to both individuals and groups, through posters,  
29 brochures, websites and short clips in waiting rooms (1). Post-test counselling is also  
30 recommended across all settings, in all HIV tests depending on the specific test result and  
31 HIV status reported (1). In order to ensure individuals are linked to the appropriate  
32 treatment and prevention services (1).  
33  
34  
35

36 Testing by trained lay providers supervised to use rapid diagnostic tests (RDTs)  
37 independently, safely and effectively (1). Testing by lay providers refers to individuals who  
38 are trained to conduct HIV tests but have no formal professional or paraprofessional  
39 certificate or tertiary education degree (1). RDT refers to a form of HIV testing that produce  
40 results quickly (usually in less than 30 minutes) enabling patients to know their result on the  
41 day in a short period of time (1). Both strategies reduce the time taken to undergo a HIV  
42 test. These components may therefore address barriers associated with time, as well as  
43 reduce the burden on resources through task shifting (15). As well as this, peer delivered  
44 testing (when lay providers are members of the same population as testers) has been shown  
45 to increase uptake, including in first time testers, and higher rates of detection of HIV cases  
46 amongst MSM and PWID in Vietnam and Thailand (16). In another study peer counsellors  
47 was identified as a facilitator for HIV testing amongst participants (3). In some populations  
48 where stigma and discrimination are present peer testing has been identified as a preferred  
49 and viable method (3, 16, 17).  
50  
51  
52  
53

### 54 **Population specific facility-based HIV testing**

55 Facility-based testing is recommended for priority populations such as pregnant women, key  
56 populations, infants and children, and adolescents (1). Diagnosing HIV as early as possible  
57 reduces mortality in infants, and in populations such as key populations and adolescents  
58  
59  
60



where testing uptake remains low differentiated testing approaches are essential in reducing barriers to testing (5, 8, 18-21).

## References.

1. WHO. Consolidated guidelines on HIV testing services. Geneva: WHO; 2015. p. 1-188.
2. Avert. HIV Testing Programmes Avert: Avert; 2019 [Available from: <https://www.avert.org/professionals/hiv-programming/testing>].
3. Woodford MR, Chakrapani V, Newman PA, Shunmugan M. Barriers and facilitators to voluntary HIV testing uptake among communities at high risk of HIV exposure in Chennai, India. *Global Public Health*. 2016;11(3):363-79.
4. Orne-Gliemann J, Zuma T, Chikocore J, Gillespie N, Grant M, Iwuji C, et al. Community perceptions of repeat HIV-testing: experiences of the ANRS 12249 Treatment as Prevention trial in rural South Africa. *AIDS Care*. 2016;28:14-23.
5. Surratt HL, O'Grady CL, Kurtz SP, Buttram ME, Levi-Minzi MA. HIV Testing and Engagement in Care among Highly Vulnerable Female Sex Workers: Implications for Treatment as Prevention Models. *Journal of Health Care for the Poor and Underserved*. 2014;25:1360-78.
6. Pharr JR, Lough NL, Ezeanolue EE. Barriers to HIV Testing Among Young Men Who Have Sex With Men (MSM): Experiences from Clark County, Nevada. *Global Journal of Health Science*. 2016;8(7).
7. Meremo A, Mboya B, Ngilangwa DP, Dulle R, Tarimo E, Urassa D, et al. Barriers to accessibility and utilization of HIV testing and counseling services in Tanzania: experience from Angaza Zaidi programme. *Pan African Medical Journal*. 2016;23(189).
8. Qiao S, Zhang Y, Li X, Menon J, Anitha. Facilitators and barriers for HIV-testing in Zambia: A systematic review of multi-level factors. *PLoS ONE*. 2018;13(2):e0192327.
9. WHO. Guidelines on HIV Self-testing and Partner notification: supplement to consolidated guidelines on HIV testing services. Geneva, Switzerland: World Health Organisation; 2016.
10. Zhang C, Xianhong L, Brecht M-L, Koniak-Griffin D. Can self-testing increase HIV testing among men who have sex with men: A systematic review and meta-analysis. *PLoS ONE*. 2017;12(11):e0188890.
11. Qin Y, Han L, Babbitt A, Walker JS, Liu F, Thirumurthy H, et al. Experiences using and organizing HIV self-testing. *AIDS*. 2018 32:371-81.
12. NAT. HIV Partner Notification: a missed opportunity. London: National AIDS Trust; 2012.
13. Dalal S, Johnson C, Fonner V, Kennedy CE, Siefried N, Figueroa C, et al. Improving HIV test uptake and case findings with assisted partner notification services. *AIDS*. 2017;31(13):1867-76.
14. Brown LB, Miller WC, Kamanga G, Nyirenda N, Mmodzi P, Pettifor A, et al. HIV Partner Notification Is Effective and Feasible in Sub-Saharan Africa: Opportunities for HIV Treatment and Prevention. *Journal of Acquired Immunodeficiency Syndrome*. 2011;56:437-42.
15. IAS. DIFFERENTIATED SERVICE DELIVERY FOR HIV: A DECISION FRAMEWORK FOR HIV TESTING SERVICES It's time to test differently.: IAS; 2018. p. 1-68.

16. Green KE, Vu BN, Huong PT, Tran MH, Ngo HV, Vo SH, et al. From conventional to disruptive: upturning the HIV testing status quo among men who have sex with men in Vietnam. 2018.
17. Ti L, Hayashi K, Kaplan K, Suwannawong P, Wood E, Montaner J, et al. Willingness to Access Peer-Delivered HIV Testing and Counseling Among People Who Inject Drugs in Bangkok, Thailand. *Journal of Community Health*. 2013;38:427-33.
18. Loos J, Manirankunda L, Hendrickx K, Remmen R, Nöstlinger C. HIV Testing in Primary Care: Feasibility and Acceptability of Provider initiated HIV Testing and Counseling for Sub-Saharan African Migrants. *AIDS Education and Prevention*. 2014;26(1):81-93.
19. Traversy GP, Austin T, Timmerman K, Gale-Rowe M. An overview of recent evidence on barriers and facilitators to HIV testing. *Canada Communicable Disease Report*. 2015;41(12).
20. DHS. Demographic patterns of HIV Testing Uptake in Sub-Saharan Africa. Calverton, Maryland, USA: ICF International; 2013.
21. Huong NTT, Hau NT, Chau NV, Tan LT, Tam NTM, Gray R, et al. Perceived barriers and facilitators to uptake of HIV testing services among people who inject drugs in Vietnam. *Journal of Substance Use*. 2018;23(6):551-6.

	Compliant
	Not complaint
	Unclear
	Concentrated epidemis
	Generalised epidemic
	Not reccomeded in this country setting

WHO region	Country	Year
AFR	Angola	2015
AMR	Argentina	2015
WPR	Australia	2017
AFR	Benin	2017
AFR	Botswana	2016
EUR	Bulgaria	2017
AFR	Cameroon	2018
EUR	Denmark	2015
WPR	China	2015
EUR	France	2017
AFR	Côte d'Ivoire	2016
EUR	Croatia	2017
AMR	Guatamala	2018
EUR	Czech Republic	2018
SEAR	India	2015
EMR	Egypt	2015
EUR	Italy	2016
EUR	Kazakhstan	2015
AFR	Ethiopia	2017
EUR	Finland	2018
AFR	Ghana	2017
EUR	Georgia	2016
EUR	Lithuania	2017
EUR	Germany	2015
AMR	Haiti	2015
AFR	Guinea	2018
AFR	Kenya	2015
EUR	Ireland	2015
AFR	Lesotho	2016
AFR	Liberia	2015
EUR	Luxembourg	2017
EUR	Netherlands	2017
AFR	Malawi	2016
WPR	Malaysia	2015
AFR	Mali	2017
EUR	Russia	2016
AFR	Mozambique	2015
SEAR	Myanmar	2017
AFR	Nigeria	2016

1			
2	EMR	Oman	2015
3	EMR	Pakistan	2017
4	EUR	Romania	2017
5	AFR	Rwanda	2016
6	AFR	Senegal	2017
7	AFR	Sierra Leone	2017
8	EUR	Slovenia	2017
9	EUR	Slovakia	2017
10	EMR	Somalia	2017
11	EUR	Sweden	2017
12	AFR	South Africa	2016
13	EMR	South Sudan	2017
14	SEAR	Sri Lanka	2016
15	AMR	Cayman Islands	2015
16	SEAR	Thailand	2017
17	EMR	Sudan	2016
18	EUR	Ukraine	2016
19	AFR	Swaziland	2018
20	AFR	Tanzania	2017
21	AFR	Uganda	2016
22	EUR	United Kingdom	2016
23	AMR	United States of America	2017
24	WPR	Vietam	2018
25	WPR	Nauru	2015
26	AFR	Zambia	2016
27	AFR	Zimbabwe	2018
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
54			
55			
56			
57			
58			
59			
60			

# Extraction Tool (Coun

HTS APPROCHES			
Community-based testing	provider assisted referral	HIV- self testing	Pre-test information
u	u	u	u
y	n	n	u
y	y	n	n
y	y	u	y
y	n	n	n
y	n	n	n
y	y	exploring	n
n	n	n	n
y	n	y	n
n	n	y	n
y	n	y	n
y	n	n	n
n	n	n	n
y	n	y	n
n	n	n	n
n	n	n	n
y	y	y	n
n	n	n	n
n	n	n	n
y	n	n	y
y	n	n	n
y	y	y	u
y	n	n	n
n	n	n	n
y	n	n	n
y	y	n	n
y	n	n	n
y	n	n	n
y	n	y	y
y	y	n	n
y	n	y	n
n	n	u	n
y	n	n	n
n	n	y	n
y	n	y	n
y	n	n	n
y	y	y	n
n	n	n	n
y	n	n	n
y	y	n	n
y	y	y	n
n	n	n	n
y	n	n	n
y	y	n	n
y	y	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

y	n	n	y
y	y	y	y
y	n	y	y
y	n	n	n
y	y	y	n
y	n	n	y
y	n	y	n
n	n	n	n
y	n	y	y
n	n	n	n
y	y	y	y
y	n	y	y
y	n	n	y
n	n	n	n
n	n	n	n
y	n	n	y
n	n	n	u
y	y	y	y
y	y	n	y
y	n	y	n
y	y	y	y
y	n	n	n
y	u	y	y
n	n	n	n
y	n	y	y
y	n	y	y

Review only

# try uptake of WHO recommendations on differentiate

HTS COMPONENTS			
Pre-test counselling	post-test counselling	Lay provider HIV testing	Rapid Diagnostic tests
y	u	u	y
y	y	y	y
n	n	u	y
n	y	y	y
y	y	y	y
n	n	n	n
y	y	n	u
n	n	n	n
n	y	n	y
n	n	n	y
y	y	y	y
y	y	n	y
n	n	n	n
n	n	n	y
y	y	n	n
y	y	n	y
n	n	n	n
y	y	n	n
n	y	y	y
n	n	n	n
y	y	y	y
n	n	n	n
n	n	n	y
n	n	n	n
y	y	y	y
n	n	n	y
n	n	n	y
y	y	y	y
n	n	y	y
y	y	y	n
n	n	n	n
y	y	n	y
n	n	y	y
n	y	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

n	y	n	y
n	y	y	y
n	y	n	y
y	y	y	y
y	y	n	n
n	y	y	y
n	n	n	y
n	n	n	n
n	y	y	y
n	n	n	n
n	y	y	y
n	y	y	y
y	n	y	y
y	y	n	n
n	n	n	n
y	y	y	y
u	n	n	y
n	y	y	y
n	y	y	y
y	n	y	y
n	y	y	y
n	n	n	n
n	y	y	u
n	n	n	y
n	y	y	y
n	y	u	y

Review only



**d HIV testing services approaches: a global policy review)**

POPULATION SPECIFIC FACILITY BASED HIV TESTING			
Adolscents	Pregnant women	Key Populations	Infants and Children
y	y	u	y
y	y	y	n
n	y	y	y
n	y	y	y
y	y	n	y
y	y	y	u
y	y	y	y
n	n	y	n
n	y	n	y
n	y	y	n
y	y	y	y
y	y	y	n
n	y	n	y
n	y	n	n
n	n	n	y
n	y	y	y
n	y	y	y
n	y	n	n
y	y	y	y
n	y	y	u
y	y	y	y
n	y	y	u
n	n	n	n
n	n	y	n
y	y	y	y
n	y	y	y
y	y	y	y
n	y	y	n
y	y	y	y
n	y	n	y
n	y	y	n
y	y	n	n
y	y	y	y
y	y	y	y
y	y	y	y
n	n	n	n
y	y	y	y
y	y	y	y
y	y	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

n	y	y	y
y	y	y	y
y	y	y	y
y	y	y	y
n	y	y	n
y	y	y	y
n	y	y	n
n	y	y	y
y	y	y	y
n	n	n	n
y	y	y	y
y	y	y	y
y	y	y	y
n	n	n	n
n	n	n	n
n	y	y	y
n	y	n	n
y	y	y	y
y	y	y	y
y	y	y	y
n	y	y	y
n	n	y	n
n	n	y	y
n	y	n	n
y	y	y	y
y	y	y	y

Review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

EPIDEMIC SPECIFIC		
Epidemic type	Community-based testing in concentrated and generalised epidemics	Facility based testing for all adolescents in all clinical settings in generalised epidemics
c	u	
c		
c	y	
g	y	n
g	y	u
g	y	y
c	n	
c	n	
g	y	y
c	n	
c	n	
c	n	
c	y	
c	y	
c	n	
c	y	
g	y	y
g	y	y
g	y	y
g	n	n
c	n	
g	y	y
c	y	
c	y	
c	n	
g	y	y
g	y	y
g	y	y

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

c	y	
g	y	y
c	y	
g	y	y
g	y	y
g	y	y
g	y	y
c	n	
c	u	
g	y	y
g	y	y
g	y	y
c	y	
c	y	
c	y	
g	y	y
g	y	y

Review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

---

Facility based testing for those with symptoms in concentrated epidemics
u
y
y
y
y
u
y
y
y
u
y
u
y
y
y
y

For peer review only

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

y
y
y
u
y
y
u

er review only