

Symbol	Parameter definition	Rwanda	Gabon	Zambia	Kenya	Malawi	Swaziland	Distribution	Sample Size	Reference
<b>Mixing matrix</b>										
	<b>Proportion of extramarital partnerships among:</b>									
$\chi_1$	married men	0.15	0.18	0.15	0.15	0.15	0.2	Beta	100	Based on proportion of married men and women reporting extra-marital sex in DHS
$\chi_2$	married women	0.1	0.1	0.1	0.1	0.1	0.1	Beta	100	
$\chi_3$	men that are with married women	0.5	0.6	0.8	0.8	0.8	0.2	Beta	100	Assumption
$\chi_4$	women that are with married men	0.95	0.9	0.85	0.5	0.65	0.9	Beta	100	Assumption
$\chi_5$	men that are not with other married women that are with never married women	0.3	0.1	0.2	0.1	0.2	0.5	Beta	100	Assumption
$\chi_6$	women that are not with other married men that are with never married men	0.3	0.2	0.2	0.8	0.9	0.3	Beta	100	Assumption
$\chi_7$	men that are not with other married women and that are not with never married women that are with previously married women	0.1	0.2	0.1	0.1	0.6	0.2	Beta	100	Assumption
$\chi_8$	women that are not with other married men and that are not with never married men that are with previously married men	0.7	0.3	0.25	0.3	0.5	0.5	Beta	100	Assumption
$\chi_9$	men that are not with previously married women that are with FSW	0.999	0.999	0.999	0.999	0.999	0.999	Beta	100	Based on proportion of married men reporting paying for sex in the DHS
$\chi_{10}$	women that are not with previously married men that are with MSM	0.7	0.7	0.7	0.7	0.7	0.7	Beta	100	Assumption
	<b>Proportion of disassortative partnerships among:</b>									
$\chi_{11}$	never married women	0.1	0.2	0.1	0.1	0.1	0.2	Beta	100	Based on proportion of 15-24 year old women reporting having sex with partners 10+ years older than themselves in DHS
$\chi_{12}$	never married men	0.1	0.6	0.2	0.6	0.4	0.2	Beta	100	Assumption
$\chi_{13}$	never married men that are with married women	0.3	0.3	0.3	0.3	0.3	0.3	Beta	100	Assumption
$\chi_{14}$	never married women that are with married men	0.8	0.5	0.8	0.85	0.9	0.9	Beta	100	Assumption
$\chi_{15}$	never married women that are with previously married men	0.8	0.5	0.8	0.9	0.9	0.9	Beta	100	Assumption
$\chi_{16}$	never married men that are with previously married women	0.5	0.5	0.5	0.3	0.3	0.4	Beta	100	
$\chi_{17}$	never married men that are not with previously married women that are with FSW	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	Beta	100	Based on proportion of men 15-24 who report paying for sex in DHS
$\chi_{18}$	never married women that are not with previously married men that are with MSM	0.9	0.9	0.9	0.9	0.9	0.9	Beta	100	Assumption

**S13 Table. Priors for the parameters informing the transmission model**

Symbol	Parameter definition	Rwanda	Gabon	Zambia	Kenya	Malawi	Swaziland	Distribution	Sample Size	Reference
<b>Mixing matrix</b>										
X <sub>19</sub>	previously married women that are not with previously married men	0.5	0.4	0.8	0.6	0.7	0.6	Beta	100	Assumption
X <sub>20</sub>	previously married men that are not with previously married women	0.9	0.1	0.3	0.1	0.1	0.1	Beta	100	Assumption
X <sub>21</sub>	previously married women that are with married men	0.85	0.8	0.8	0.6	0.7	0.95	Beta	100	Assumption
X <sub>22</sub>	previously married men that are with married women	0.6	0.6	0.6	0.7	0.7	0.6	Beta	100	Assumption
X <sub>23</sub>	previously married men that are not with married women that are with never married women	0.6	0.6	0.6	0.6	0.6	0.6	Beta	100	Assumption
X <sub>24</sub>	previously married women that are not with married men that are with never married	0.9	0.85	0.85	0.85	0.85	0.85	Beta	100	Assumption
X <sub>25</sub>	previously married men that are not with never married women that are with FSW	0.999	0.999	0.999	0.999	0.999	0.999	Beta	100	Assumption based on proportion of previously married men reporting paying for sex in the DHS
X <sub>26</sub>	previously married women that are not with never married men that are with MSM	0.9	0.9	0.9	0.9	0.9	0.9	Beta	100	Assumption
X <sub>27</sub>	MWID	0.3	0.3	0.3	0.1	0.1	0.2	Beta	100	Based on the fact that mixing among PWID is highly assortative
X <sub>28</sub>	among MWID that are with FWID	0.7	0.7	0.7	0.7	0.7	0.7	Beta	100	Based on the fact that mixing among PWID is highly assortative
X <sub>29</sub>	MWID that are not with FWID that are with married women	0.1	0.1	0.1	0.1	0.1	0.1	Beta	100	Assumption
X <sub>30</sub>	MWID that are not with FWID that are not with married women that are with never married women	0.2	0.2	0.2	0.2	0.2	0.2	Beta	100	Assumption
X <sub>31</sub>	MWID that are not with FWID that are not with married women that are not with never married women that are with previously married women	0.3	0.3	0.3	0.3	0.3	0.3	Beta	100	Assumption
X <sub>32</sub>	MWID that are not with FWID that are not with married women that are not with never married women that are not with previously married women that are with FSW	0.8	0.8	0.8	0.8	0.8	0.8	Beta	100	Assumption
X <sub>33</sub>	FWID	0.5	0.5	0.5	0.8	0.8	0.7	Beta	100	Based on the fact that mixing among PWID is very assortative
X <sub>34</sub>	FWID that are with MWID	0.8	0.8	0.8	0.8	0.8	0.8	Beta	100	Based on the fact that mixing among PWID is very assortative
X <sub>35</sub>	FWID that are not with MWID that are with married men	0.2	0.2	0.2	0.2	0.2	0.2	Beta	100	Assumption
X <sub>36</sub>	FWID that are not with MWID that are not with married men that are with never married men	0.5	0.5	0.5	0.5	0.5	0.5	Beta	100	Assumption
X <sub>37</sub>	FWID that are not with MWID that are not with married men that are not with never married men that are with previously married men	0.5	0.5	0.5	0.5	0.5	0.5	Beta	100	Assumption

S13 Table ctd. Priors for the parameters informing the transmission model

Symbol	Parameter definition	Rwanda	Gabon	Zambia	Kenya	Malawi	Swaziland	Distribution	Sample Size	Reference
<b>Mixing Matrix</b>										
X <sub>38</sub>	MSM	0.1	0.15	0.15	0.1	0.1	0.1	Beta	100	Based on the fact that mixing among MSM is very assortative
X <sub>39</sub>	MSM that are with married women	0.3	0.3	0.3	0.3	0.3	0.3	Beta	100	Based on proportion of MSM who report being married
X <sub>40</sub>	MSM that are not with married women that are with never married women	0.3	0.3	0.3	0.2	0.2	0.3	Beta	100	Assumption
X <sub>41</sub>	MSM that are not with married women that are not with never married women that are with previously married women	0.2	0.2	0.2	0.2	0.2	0.2	Beta	100	Assumption
X <sub>42</sub>	MSM that are not with married women that are not with never married women that are not with previously married women that are with MWID	0.02	0.02	0.02	0.02	0.02	0.02	Beta	100	Assumption
X <sub>43</sub>	MSM that are not with married women that are not with never married women that are not with previously married women that are not with MWID that are with FSW	0.9	0.9	0.9	0.8	0.8	0.8	Beta	100	Assumption
X <sub>44</sub>	FSW that are not with never married men	0.1	0.1	0.1	0.1	0.1	0.1	Beta	100	Based on the fact that the majority of men reporting paying for sex are married men
X <sub>45</sub>	FSW that are not with never married men that are with married men	0.9	0.8	0.9	0.9	0.9	0.8	Beta	100	Assumption
X <sub>46</sub>	FSW that are not with never married men that are not with married men that are with previously married men	0.95	0.95	0.95	0.95	0.95	0.95	Beta	100	Assumption
X <sub>47</sub>	FSW that are not with never married men that are not with married men that are not with previously married men that are with MWID	0.2	0.2	0.2	0.2	0.2	0.2	Beta	100	Assumption
<b>Transmissibility degree among:</b>								<b>Distribution</b>	<b>Standard deviation</b>	
T <sub>1-4</sub>	Serodiscordant positive unions where the woman is positive	0.1	0.1	0.1	0.1	0.1	0.1	Normal	0.02	Baseline
T <sub>5-8</sub>	serodiscordant positive unions where the man is positive	0.2	0.2	0.2	0.2	0.2	0.2	Normal	0.04	2 folds higher transmission probability compared to women
T <sub>9</sub>	Seroconcordant positive unions	0.15	0.15	0.15	0.15	0.15	0.15	Normal	0.03	Average between transmissibility in serodiscordant unions where man and woman is positive respectively
T <sub>10-11</sub>	Never married men	0.16	0.16	0.16	0.16	0.16	0.16	Normal	0.032	Higher condom use than among married men and two folds transmission probability compared to women
T <sub>12</sub>	Never married women	0.08	0.08	0.08	0.08	0.08	0.08	Normal	0.016	Higher condom use than among married women
T <sub>13-14</sub>	Previously married men	0.2	0.2	0.2	0.2	0.2	0.2	Normal	0.04	Assumed to be equal to that among married men
T <sub>15</sub>	Previously married women	0.1	0.1	0.1	0.1	0.1	0.1	Normal	0.02	Assumed to be equal to that among married women
T <sub>18</sub>	FSW	0.1	0.1	0.1	0.1	0.1	0.1	Normal	0.02	Assumed to be equal to that among married women (fewer sex acts/higher condom use)
T <sub>19</sub>	FWID	0.2	0.2	0.2	0.2	0.2	0.2	Normal	0.04	Assumed to be higher than among married women
T <sub>20</sub>	MSM	0.3	0.3	0.3	0.3	0.3	0.3	Normal	0.06	Assumed to be higher than among married men (anal sex)
T <sub>21</sub>	MWID	0.2	0.2	0.2	0.2	0.2	0.2	Normal	0.04	Assumed to be equal to that among married men

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