**Influenza Disease Burden among Potential Target Risk Groups for Immunization in South Africa, 2013-2015 (Supplementary Material)**

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**METHODS**

**Estimation of the number of individuals in the general population within selected potential target groups for influenza immunization**

*Individuals aged <6 months, 6-59 months, 5-64 years, ≥65 years and pregnant women*

We first obtained the number of individuals aged <1, <5, 5-64 and ≥65 years and pregnant women from DS1.a and DS1.b [[[1]](#endnote-1),[[2]](#endnote-2),[[3]](#endnote-3),[[4]](#endnote-4)]. We inferred the number of infants aged <6 months from the relative proportion among children aged <1 year (DS1.a) adjusting for neonatal and infant mortality [[[5]](#endnote-5)]. We obtained the number of children aged 6-59 months by subtracting the estimated number of infants aged <6 months from the estimated number of children aged <5 years (DS1.a). To obtain the number of individuals aged 5-64 years excluding pregnant women we subtracted the number of pregnant women from the number of individuals in this age group.

*HIV-infected individuals*

We obtained the number of HIV-infected individuals aged <1, <5, 5-64 and ≥65 years and pregnant women from DS1.c [4]. We considered the HIV prevalence among infants aged <6 months and <1 year to be the same and applied this proportion to the number of infants aged <6 months. We obtained the number of HIV-infected children aged 6-59 months by subtracting the estimated number of HIV-infected infants aged <6 months to the estimated number of HIV-infected children aged <5 years. To obtain the number of HIV-infected individuals aged 5-64 years excluding pregnant women we subtracted the number of HIV-infected pregnant women from the number of HIV-infected-individuals in this age group.

*Individuals with pulmonary tuberculosis (PTB)*

We obtained the number of individuals aged <5, 5-14, 15-64 and ≥65 years with PTB from DS1.d [[[6]](#endnote-6)]. We considered the PTB prevalence among infants aged <6 months and <5 years to be the same and applied this proportion to the number of infants aged <6 months. We obtained the number of children aged 6-59 months with PTB by subtracting the estimated number of infants aged <6 months with PTB to the estimated number of children aged <5 years with PTB. We considered the PTB prevalence among pregnant women and individuals aged 15-64 years to be the same and applied this proportion to the number of pregnant women. To obtain the number of individuals aged 5-64 years with PTB excluding pregnant women we subtracted the number of pregnant women with PTB from the number of individuals with PTB in this age group.

*Individuals with underlying medical conditions (UMC)*

We estimated the prevalence of the UMC considered in this study among individuals aged <1, <5, 5-64, and ≥65 years and women of child bearing age (i.e., 15-49 years) from DS1.e [[[7]](#endnote-7)]. We considered the UMC prevalence among infants aged <6 months and <1 year to be the same and applied this proportion to the number of infants aged <6 months. We obtained the number of children aged 6-59 months with UMC by subtracting the estimated number of infants aged <6 months with UMC to the estimated number of children aged <5 years with UMC. We considered the UMC prevalence among pregnant women and women of childbearing age to be the same and applied this proportion to the number of pregnant women. To obtain the number of individuals aged 5-64 years with UMC excluding pregnant women we subtracted the number of pregnant women with UMC from the number of individuals with UMC in this age group.

*Co-occurrence of HIV, TB or UMC*

We considered that 60% of individuals with TB were HIV co-infected as reported in published literature from South Africa [6]. We considered the same prevalence of UMC by age groups among individuals with PTB and the general population; whereas we considered HIV-infected individuals to be 1.58 times more likely to also have UMC than HIV-uninfected individuals as reported in published literature [[[8]](#endnote-8)]. This adjustment factor was applied for HIV-infected only and HIV-TB co-infected individuals.

**RESULTS**

**Table S1:** Estimated mean annual rates and number of medically- and non-medically-attended influenza-associated mild illness among potential target risk groups for influenza immunization in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk groups** | **Medically-attended illness** | | **Non-medically-attended illness** | |
| **Rate (95% CI)** | **Number (95% CI)** | **Rate (95% CI)** | **Number (95% CI)** |
| Children aged 6-59 monthsa | 5,279 (3,801-6,757) | 274,693 (197,779-351,607) | 18,704 (13467-23941) | 973,334 (700,800-1,245,868) |
| Individuals aged 5-64 years with HIV and/or PTB and/or UMC (excluding pregnant women)b | 5,290 (4,179-6,400) | 815,939 (644,592-987,286) | 15,077 (11,911-18,243) | 2,325,601 (1,837,225-2,813,977) |
| HIV | 5,290 (3,967-6,612) | 340,121 (255,091-425,151) | 15,077 (11,307-18,846) | 969,416 (727,062-1,211,770) |
| PTB | 5,290 (3,280-7,299) | 17,596 (10,910-24,282) | 15,077 (9,347-20,806) | 50,153 (31,095-69,211) |
| UMC | 5,290 (3,914-6,665) | 609,654 (451,144-768,164) | 15,077 (11,157-18,997) | 1,737,646 (1,285,858-2,189,434) |
| Individuals aged ≥65 yearsa | 653 (2,70-1,036) | 19,700 (8,138-31,246) | 2,055 (838-3,255) | 61,967 (25,260-98,135) |
| Pregnant womena | 4,676 (3,414-5,939) | 43,274 (31,590-54,958) | 10,834 (7,909-13,759) | 100,255 (73,186-127,324) |
| Individuals aged ≥6 months with HIV and/or PTB and/or UMC (including pregnant women)b | 4,833 (3,915-5,751) | 874,749 (708,547-1,040,951) | 13,861 (11,228-16,495) | 2,508,788 (2,032,118-2,985,458) |
| HIV | 5,230 (4,132-6,329) | 353,918 (279,595-428,241) | 14,873 (11,750-17,997) | 1,006,417 (795,069-1,217,765) |
| PTB | 5,104 (3,471-6,737) | 18,239 (12,403-24,075) | 14,522 (9,875-19,169) | 51,895 (35,289-68,501) |
| UMC | 4,709 (3,579-5,839) | 659,121 (500,932-817,310) | 13,538 (10,289-16,787) | 1,894,995 (1,440,196-2,349,794) |
| Totalc | 4,695 (3,590-5,800) | 1,153,606 (882,099-1,425,097) | 14,087 (10,731-17,442) | 3,461,157 (2,636,471-4,285,304) |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

Rates reported per 100,000 person year.

a Includes individuals with HIV and/or PTB and/or UMC.

b The HIV, PTB and UMC categories are not mutually exclusive (e.g. the HIV category includes any individual with HIV within the specified age group, including individuals with tuberculosis co-infection and/or underlying medical conditions).

c The total number of individuals in the selected risk groups accounts for co-infection and co-morbidities. It is calculated as the sum of the following: (i) children aged 6-59 months; (ii) individuals aged 5-64 years (excluding pregnant women) with HIV and/or PTB and/or UMC; (iii) individuals aged ≥65 years; and (iv) pregnant women.

**Table S2:** Estimated mean annual rates and number of medically- and non-medically-attended influenza-associated severe-non-fatal illness among potential target risk groups for influenza immunization in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk groups** | **Medically-attended illness** | | **Non-medically-attended illness** | |
| **Rate (95% CI)** | **Number (95% CI)** | **Rate (95% CI)** | **Number (95% CI)** |
| Children aged 6-59 monthsa | 234 (168-299) | 12,171 (8,763-15,579) | 274 (197-351) | 14,258 (10,266-18,250) |
| Individuals aged 5-64 years with HIV and/or PTB and/or UMC (excluding pregnant women)b | 147 (116-178) | 22,712 (17,942-27,482) | 196 (154-237) | 30,163 (23,829-36,497) |
| HIV | 296 (222-370) | 19,047 (14,285-23,809) | 393 (295-491) | 25,258 (18,944-31,573) |
| PTB | 354 (220-489) | 1,179 (731-1,627) | 470 (291-648) | 1,563 (969-2,157) |
| UMC | 112 (83-142) | 12,951 (9,584-16,318) | 149 (110-188) | 17,175 (12,710-21,641) |
| Individuals aged ≥65 yearsa | 329 (144-570) | 9,921 (4,342-17,175) | 433 (180-787) | 13,045 (5,428-23,717) |
| Pregnant womena | 425 (310-540) | 3,936 (2,873-4,999) | 544 (397-691) | 5,038 (3,678-6,398) |
| Individuals aged ≥6 months with HIV and/or PTB and/or UMC (including pregnant women)b | 204 (165-242) | 36,851 (29,849-43,853) | 266 (215-316) | 48,121 (38,978-57,264) |
| HIV | 338 (267-409) | 22,900 (18,091-27,709) | 445 (352-539) | 30,143 (23,813-36,473) |
| PTB | 482 (328-636) | 17,23 (1,172-2,274) | 634 (432-837) | 2,267 (1,542-2,992) |
| UMC | 179 (136-222) | 25,080 (19,061-31,099) | 233 (177-289) | 32,621 (24,792-40,450) |
| Totalc | 198 (138-266) | 48,740 (33,920-65,235) | 254 (176-345) | 62,504 (43,201-84,862) |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

Rates reported per 100,000 person year.

a Includes individuals with HIV and/or PTB and/or UMC.

b The HIV, PTB and UMC categories are not mutually exclusive (e.g. the HIV category includes any individual with HIV within the specified age group, including individuals with tuberculosis co-infection and/or underlying medical conditions).

c The total number of individuals in the selected risk groups accounts for co-infection and co-morbidities. It is calculated as the sum of the following: (i) children aged 6-59 months; (ii) individuals aged 5-64 years (excluding pregnant women) with HIV and/or PTB and/or UMC; (iii) individuals aged ≥65 years; and (iv) pregnant women.

**Table S3:** Estimated mean annual rates and number of in- and out-of-hospital influenza-associated deaths among potential target risk groups for influenza immunization in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk groups** | **In-hospital deaths** | | **Out-of-hospital deaths** | |
| **Rate (95% CI)** | **Number (95% CI)** | **Rate (95% CI)** | **Number (95% CI)** |
| Children aged 6-59 monthsa | 8 (6-10) | 167 (114-220) | 9 (6-11) | 458 (330-586) |
| Individuals aged 5-64 years with HIV and/or PTB and/or UMC (excluding pregnant women)b | 15 (12-19) | 410 (295-525) | 22 (17-26) | 3,347 (2,644-4,050) |
| HIV | 34 (25-42) | 2,380 (1,880-2,880) | 47 (35-59) | 3,029 (2,272-3,786) |
| PTB | 57 (35-78) | 2,155 (1,616-2,694) | 80 (49-110) | 265 (164-366) |
| UMC | 12 (9-15) | 188 (117-259) | 16 (12-21) | 1,900 (1,406-2,394) |
| Individuals aged ≥65 yearsa | 60 (25-106) | 1,352 (1,000-1,704) | 78 (32-142) | 2,348 (950-4,296) |
| Pregnant womena | 7 (5-9) | 1,811 (759-3,197) | 9 (7-12) | 85 (62-108) |
| Individuals aged ≥6 months with HIV and/or PTB and/or UMC (including pregnant women)b | 21 (17-25) | 64 (47-81) | 28 (23-34) | 5,101 (4,132-6,070) |
| HIV | 40 (32-49) | 3,763 (3,048-4,478) | 55 (44-67) | 3,748 (2,961-4,535) |
| PTB | 63 (43-83) | 2,726 (2,154-3,298) | 87 (59-114) | 310 (211-409) |
| UMC | 19 (14-23) | 224 (152-296) | 25 (19-31) | 3,524 (2,678-4,370) |
| Totalc | 19 (12-27) | 2,618 (1,990-3,246) | 25 (16-37) | 6,238 (3,986-9,040) |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

Rates reported per 100,000 person year.

a Includes individuals with HIV and/or PTB and/or UMC.

b The HIV, PTB and UMC categories are not mutually exclusive (e.g. the HIV category includes any individual with HIV within the specified age group, including individuals with tuberculosis co-infection and/or underlying medical conditions).

c The total number of individuals in the selected risk groups accounts for co-infection and co-morbidities. It is calculated as the sum of the following: (i) children aged 6-59 months; (ii) individuals aged 5-64 years (excluding pregnant women) with HIV and/or PTB and/or UMC; (iii) individuals aged ≥65 years; and (iv) pregnant women.

**Table S4:** Estimated mean annual number of medically- and non-medically-attended influenza-associated illness among infants aged <6 months and individuals aged 5-64 years without HIV, pulmonary tuberculosis (PTB) or other underlying medical conditions in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Influenza-associated illness** | **Medically-attended illnessa** | | **Non-medically-attended illnessb** | |
| **Rate (95% CI)** | **Number (95% CI)** | **Rate (95% CI)** | **Number (95% CI)** |
| **Infants aged <6 months** | | | | |
| Mild | 8,585 (5,838-11,332) | 50,880 (34,598-67,162) | 17,650 (12,002-23,298) | 104,604 (71,131-138,077) |
| Severe-non-fatal | 539 (366-711) | 3,192 (2,171-4,213) | 630 (428-831) | 3,731 (2,537-4,925) |
| Death | 28 (19-37) | 167 (114-220) | 33 (22-43) | 195 (133-257) |
| **Individuals aged 5-64 years without HIV, PTB or UMC (excluding pregnant women)** | | | | |
| Mild | 5,233 (3,820-6,646) | 1,513,654 (1,104,967-1,922,341) | 4,314,237 (3,149,393-5,479,081) | 14,916 (10,888-18,943) |
| Severe-non-fatal | 15 (11-19) | 4,293 (3,134-5,452) | 20 (14-25) | 5,711 (4,169-7,253) |
| Death | 0.4 (0.3-0.5) | 113 (82-144) | 0.5 (0.4-0.7) | 157 (115-199) |

Abbreviations: CI: confidence intervals.

Rates reported per 100,000 person year.

a Medically-attended deaths defined as occurring in hospital.

b Non-medically-attended deaths defined as occurring out of the hospital.

**Table S5:** Estimated mean annual rates and number of total (medically and non-medically-attended) influenza-associated influenza-like-illness (mild) among potential target risk groups for influenza immunization in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk group** | **Rate (95% CI)** | **Number (95% CI)** | **% over of illness in risk groups** | **% of total illnessa** |
| Children aged 6-59 monthsb | 7,602 (5,473-9,730) | 395,569 (284,810-506,328) | 25.5 | 11.0 |
| Individuals aged 5-64 years with HIV and/or PTB and/or UMC (excluding pregnant women)c | 6,997 (5,528-8,467) | 1,079,373 (852,705-1,306,041) | 69.7 | 30.0 |
| HIV | 6,997 (5,248-8,747) | 449,932 (337,449-562,415) | 29.0 | 12.5 |
| PTB | 6,997 (4,338-9,656) | 23,277 (14,432-32,122) | 1.5 | 0.6 |
| UMC | 6,997 (5,178-8,817) | 806,488 (59,6801-1,016,175) | 52.1 | 22.4 |
| Individuals aged ≥65 yearsb | 887 (717-2,523) | 26,749 (21,617-76,072) | 1.7 | 0.7 |
| Pregnant womenb | 5,118 (3,736-6,500) | 47,364 (34,576-60,152) | 3.1 | 1.3 |
| Individuals aged ≥6 months with HIV and/or PTB and/or UMC (including pregnant women)c | 6,394 (5,179-7,609) | 1,157,301 (937,414-1,377,188) | 74.7 | 32.2 |
| HIV | 6,894 (5,446-8,341) | 466,464 (368,507-564,421) | 30.1 | 13.0 |
| PTB | 6,732 (4,577-8,886) | 24,055 (16,357-31,753) | 1.6 | 0.7 |
| UMC | 6,237 (4,740-7,733) | 873,006 (663,485-1,082,527) | 56.4 | 24.3 |
| Totald | 6,305 (4,859-7,931) | 1,549,055 (1,193,708-1,948,593) | 100.0 | 43.1 |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

Rates reported per 100,000 person year.

a Total influenza-associated influenza-like illness (3,593,813) obtained from Tempia *et al.* [[[9]](#endnote-9)]

b Includes individuals with HIV and/or PTB and/or UMC.

c The HIV, PTB and UMC categories are not mutually exclusive (e.g. the HIV category includes any individual with HIV within the specified age group, including individuals with tuberculosis co-infection and/or underlying medical conditions).

d The total number of individuals in the selected risk groups accounts for co-infection and co-morbidities. It is calculated as the sum of the following: (i) children aged 6-59 months; (ii) individuals aged 5-64 years (excluding pregnant women) with HIV and/or PTB and/or UMC; (iii) individuals aged ≥65 years; and (iv) pregnant women.

**Table S6:** Estimated mean annual rates and number of medically- and non-medically-attended influenza-associated influenza-like illness (mild) among potential target risk groups for influenza immunization in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk groups** | **Medically-attended illness** | | **Non-medically-attended illness** | |
| **Rate (95% CI)** | **Number (95% CI)** | **Rate (95% CI)** | **Number (95% CI)** |
| Children aged 6-59 monthsa | 1,755 (1,264-2,246) | 91,325 (65,754-116,896) | 5,847 (4,210-7,484) | 304,244 (219,056-389,432) |
| Individuals aged 5-64 years with HIV and/or PTB and/or UMC (excluding pregnant women)b | 1,816 (1,435-2,197) | 280,121 (221,296-338,946) | 5,181 (4,093-6,270) | 799,252 (631,409-967,095) |
| HIV | 1,816 (1,362-2,270) | 116,767 (87,575-145,959) | 5,181 (3,886-6,477) | 333,165 (249,874-416,456) |
| PTB | 1,816 (1,126-2,506) | 6,041 (3,745-8,337) | 5,181 (3,212-7,150) | 17,236 (10,686-23,786) |
| UMC | 1,816 (1,344-2,288) | 209,302 (154,883-263,721) | 5,181 (3,834-6,529) | 597,187 (441,918-752,456) |
| Individuals aged ≥65 yearsa | 211 (138-555) | 6,350 (4,152-16,745) | 677 (3,90-1,968) | 20,399 (11,743-59,327) |
| Pregnant womena | 1,543 (1,126-1,960) | 14,280 (10,424-18,136) | 3,575 (2,610-4,540) | 33,084 (24,151-42,017) |
| Individuals aged ≥6 months with HIV and/or PTB and/or UMC (including pregnant women)b | 1,655 (1,340-1,969) | 299,516 (242,608-356,424) | 4,739 (3,839-5,640) | 857,785 (694,806-1,020,764) |
| HIV | 1,793 (1,416-2,170) | 121,327 (95,848-146,806) | 5,101 (4,029-6,172) | 345,137 (272,658-417,616) |
| PTB | 1,750 (1,190-2,310) | 6,253 (42,52-8,254) | 4,982 (3,387-6,576) | 17,802 (12,105-23,499) |
| UMC | 1,612 (1,225-1,999) | 225,606 (171,461-279,751) | 4,625 (3,515-5,735) | 647,400 (492,024-802,776) |
| Totalc | 1,596 (1,228-1,997) | 392,076 (301,626-490,723) | 4,709 (3,608-5,934) | 1,156,979 (886,359-1,457,871) |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

Rates reported per 100,000 person year.

a Includes individuals with HIV and/or PTB and/or UMC.

b The HIV, PTB and UMC categories are not mutually exclusive (e.g. the HIV category includes any individual with HIV within the specified age group, including individuals with tuberculosis co-infection and/or underlying medical conditions).

c The total number of individuals in the selected risk groups accounts for co-infection and co-morbidities. It is calculated as the sum of the following: (i) children aged 6-59 months; (ii) individuals aged 5-64 years (excluding pregnant women) with HIV and/or PTB and/or UMC; (iii) individuals aged ≥65 years; and (iv) pregnant women.

**Table S7:** Estimated mean annual rates and number of total (medically and non-medically-attended) influenza-associated severe acute respiratory illness (severe-non-fatal) among potential target risk groups for influenza immunization in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk group** | **Rate (95% CI)** | **Number (95% CI)** | **% of total illness in risk groups** | **% of total illnessa** |
| Children aged 6-59 monthsb | 352 (253-450) | 18,309 (13,182-23,436) | 41.6 | 35.5 |
| Individuals aged 5-64 years with HIV and/or PTB and/or UMC (excluding pregnant women)c | 108 (85-130) | 16,610 (13,122-20,098) | 37.7 | 32.2 |
| HIV | 216 (162-271) | 13,917 (10,438-17,396) | 31.6 | 27.0 |
| PTB | 259 (161-357) | 861 (534-1,188) | 2.0 | 1.7 |
| UMC | 82 (61-103) | 9,463 (7,003-11,923) | 21.5 | 18.3 |
| Individuals aged ≥65 yearsb | 183 (39-378) | 5,524 (1,165-11,384) | 12.5 | 10.7 |
| Pregnant womenb | 391 (285-496) | 3,617 (2,640-4,594) | 8.2 | 7.0 |
| Individuals aged ≥6 months with HIV and/or PTB and/or UMC (including pregnant women)c | 160 (130-191) | 28,991 (23,483-34,499) | 65.8 | 56.2 |
| HIV | 259 (204-313) | 17,496 (13,822-21,170) | 39.7 | 33.9 |
| PTB | 357 (243-471) | 1276 (868-1,684) | 2.9 | 2.5 |
| UMC | 141 (107-175) | 19,702 (14,974-24,430) | 44.7 | 38.2 |
| Totald | 179 (123-242) | 44,060 (30,109-59,512) | 100.0 | 85.4 |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

Rates reported per 100,000 person year.

a Total influenza-associated severe acute respiratory illness (51,621) obtained from Tempia *et al.* [9].

b Includes individuals with HIV and/or PTB and/or UMC.

c The HIV, PTB and UMC categories are not mutually exclusive (e.g. the HIV category includes any individual with HIV within the specified age group, including individuals with tuberculosis co-infection and/or underlying medical conditions).

d The total number of individuals in the selected risk groups accounts for co-infection and co-morbidities. It is calculated as the sum of the following: (i) children aged 6-59 months; (ii) individuals aged 5-64 years (excluding pregnant women) with HIV and/or PTB and/or UMC; (iii) individuals aged ≥65 years; and (iv) pregnant women.

**Table S8:** Estimated mean annual rates and number of medically- and non-medically-attended influenza-associated severe acute respiratory illness (severe-non-fatal) among potential target risk groups for influenza immunization in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk groups** | **Medically-attended illness** | | **Non-medically-attended illness** | |
| **Rate (95% CI)** | **Number (95% CI)** | **Rate (95% CI)** | **Number (95% CI)** |
| Children aged 6-59 monthsa | 365 (248-482) | 2,163 (1,471-2,855) | 384 (261-507) | 2,276 (1,548-3,004) |
| Individuals aged 5-64 years with HIV and/or PTB and/or UMC (excluding pregnant women)b | 172 (124-220) | 8,930 (6,430-11,430) | 180 (130-231) | 9,378 (6,752-12,004) |
| HIV | 53 (42-64) | 8,149 (6,438-9,860) | 55 (43-66) | 8,461 (6,684-10,238) |
| PTB | 106 (80-133) | 6,828 (5,121-8,535) | 110 (83-138) | 7,088 (5,316-8,860) |
| UMC | 127 (79-175) | 422 (262-582) | 132 (82-182) | 438 (272-604) |
| Individuals aged ≥65 yearsa | 40 (30-51) | 4,643 (3,436-5,850) | 42 (31-53) | 4,820 (3,567-6,073) |
| Pregnant womena | 89 (19-175) | 2,680 (561-5,281) | 94 (20-202) | 2,844 (604-6,104) |
| Individuals aged ≥6 months with HIV and/or PTB and/or UMC (including pregnant women)b | 193 (141-245) | 1,782 (1,301-2,263) | 198 (145-252) | 1,834 (1,339-2,329) |
| HIV | 78 (63-93) | 14,188 (11,492-16,884) | 82 (66-97) | 14,803 (11,990-17,616) |
| PTB | 127 (100-153) | 8,580 (6,778-10,382) | 132 (104-159) | 8,915 (7,043-10,787) |
| UMC | 175 (119-231) | 625 (425-825) | 182 (124-240) | 650 (442-858) |
| Totalc | 69 (52-85) | 9,632 (7,320-11,944) | 72 (55-89) | 10,070 (7,653-12,487) |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

Rates reported per 100,000 person year.

a Includes individuals with HIV and/or PTB and/or UMC.

b The HIV, PTB and UMC categories are not mutually exclusive (e.g. the HIV category includes any individual with HIV within the specified age group, including individuals with tuberculosis co-infection and/or underlying medical conditions).

c The total number of individuals in the selected risk groups accounts for co-infection and co-morbidities. It is calculated as the sum of the following: (i) children aged 6-59 months; (ii) individuals aged 5-64 years (excluding pregnant women) with HIV and/or PTB and/or UMC; (iii) individuals aged ≥65 years; and (iv) pregnant women.

**Table S9:** Estimated mean annual rates and number of total (medically and non-medically-attended) influenza-associated severe acute respiratory illness deaths among potential target risk groups for influenza immunization in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk group** | **Rate (95% CI)** | **Number (95% CI)** | **% of total illness in risk groups** | **% of total illnessa** |
| Children aged 6-59 monthsb | 5 (4-7) | 272 (196-348) | 12.7 | 11.9 |
| Individuals aged 5-64 years with HIV and/or PTB and/or UMC (excluding pregnant women)c | 7 (5-8) | 1,040 (822-1,258) | 48.6 | 45.4 |
| HIV | 15 (11-18) | 941 (706-1,176) | 43.9 | 41.1 |
| PTB | 25 (15-34) | 82 (51-113) | 3.8 | 3.6 |
| UMC | 5 (4-6) | 590 (437-743) | 27.5 | 25.8 |
| Individuals aged ≥65 yearsb | 26 (5-53) | 778 (164-1,603) | 36.3 | 34.0 |
| Pregnant womenb | 6 (4-7) | 52 (38-66) | 2.4 | 2.3 |
| Individuals aged ≥6 months with HIV and/or PTB and/or UMC (including pregnant women)c | 9 (8-11) | 1,696 (1,374-2,018) | 79.2 | 74.0 |
| HIV | 18 (14-22) | 1,231 (972-1,490) | 57.5 | 53.7 |
| PTB | 28 (19-37) | 100 (68-132) | 4.7 | 4.4 |
| UMC | 8 (6-10) | 1,173 (891-1,455) | 54.8 | 51.2 |
| Totald | 9 (5-13) | 2,142 (1,220-3,275) | 100.0 | 93.5 |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

Rates reported per 100,000 person year.

a Total influenza-associated severe acute respiratory illness deaths (2,291) obtained from Tempia *et al.* [9]

b Includes individuals with HIV and/or PTB and/or UMC.

c The HIV, PTB and UMC categories are not mutually exclusive (e.g. the HIV category includes any individual with HIV within the specified age group, including individuals with tuberculosis co-infection and/or underlying medical conditions).

d The total number of individuals in the selected risk groups accounts for co-infection and co-morbidities. It is calculated as the sum of the following: (i) children aged 6-59 months; (ii) individuals aged 5-64 years (excluding pregnant women) with HIV and/or PTB and/or UMC; (iii) individuals aged ≥65 years; and (iv) pregnant women.

**Table S10:** Estimated mean annual rates and number of medically- and non-medically-attended influenza-associated severe acute respiratory illness deaths among potential target risk groups for influenza immunization in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk groups** | **Medically-attended illness** | | **Non-medically-attended illness** | |
| **Rate (95% CI)** | **Number (95% CI)** | **Rate (95% CI)** | **Number (95% CI)** |
| Children aged 6-59 monthsa | 3 (2-3) | 136 (98-174) | 3 (2-3) | 136 (98-174) |
| Individuals aged 5-64 years with HIV and/or PTB and/or UMC (excluding pregnant women)b | 3 (3-4) | 508 (401-615) | 3 (3-4) | 532 (420-644) |
| HIV | 7 (5-9) | 461 (346-576) | 7 (6-9) | 480 (360-600) |
| PTB | 12 (8-17) | 40 (25-55) | 13 (8-17) | 42 (26-58) |
| UMC | 3 (2-3) | 289 (214-364) | 3 (2-3) | 301 (223-379) |
| Individuals aged ≥65 yearsa | 13 (3-25) | 381 (80-751) | 13 (3-28) | 397 (84-852) |
| Pregnant womena | 3 (2-3) | 25 (18-32) | 3 (2-4) | 27 (20-34) |
| Individuals aged ≥6 months with HIV and/or PTB and/or UMC (including pregnant women)b | 5 (4-5) | 832 (674-990) | 5 (4-6) | 864 (700-1,028) |
| HIV | 9 (7-11) | 604 (477-731) | 9 (7-11) | 627 (495-759) |
| PTB | 14 (9-18) | 49 (33-65) | 14 (10-19) | 51 (35-67) |
| UMC | 4 (3-5) | 575 (437-713) | 4 (3-5) | 598 (454-742) |
| Totalc | 4 (2-6) | 1,050 (597-1,572) | 4 (3-7) | 1,092 (622-1,704) |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

Rates reported per 100,000 person year.

a Includes individuals with HIV and/or PTB and/or UMC.

b The HIV, PTB and UMC categories are not mutually exclusive (e.g. the HIV category includes any individual with HIV within the specified age group, including individuals with tuberculosis co-infection and/or underlying medical conditions).

c The total number of individuals in the selected risk groups accounts for co-infection and co-morbidities. It is calculated as the sum of the following: (i) children aged 6-59 months; (ii) individuals aged 5-64 years (excluding pregnant women) with HIV and/or PTB and/or UMC; (iii) individuals aged ≥65 years; and (iv) pregnant women.

**Table S11:** Estimated mean annual number of influenza-associated illness (only meeting the ILI and SARI case definition) among infants aged <6 months and individuals aged 5-64 years without HIV, pulmonary tuberculosis (PTB) or other underlying medical conditions in South Africa, 2013-2015

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | **Rate (95% CI)** | **Number (95% CI)** | **% of total** |
| **Infants aged <6 months** | | | |
| ILI (mild) | 7,155 (4,865-9,444) | 42,403 (28,834-55,972) | 1.2 |
| SARI (severe-non-fatal) | 749 (509-989) | 4,439 (3,019-5,859) | 8.6 |
| SARI (fatal) | 17 (11-22) | 100 (68-132) | 4.4 |
| **Individuals aged 5-64 years without HIV, PTB or UMC (excluding pregnant women)** | | | |
| ILI (mild) | 6,923 (5054-8,792) | 2,002,354 (1,461,718-2,542,990) | 55.7 |
| SARI (severe-non-fatal) | 11 (8-14) | 3,122 (2,279-3,965) | 6.0 |
| SARI (fatal) | 0.2 (0.1-0.3) | 49 (36-62) | 2.1 |

Abbreviations: CI: confidence intervals; ILI: influenza-like-illness; SARI: severe acute respiratory illness.

Rates reported per 100,000 person year.

**Table S12:** Estimated mean annual number of medically- and non-medically-attended influenza-associated illness (only meeting the ILI and SARI case definition) among infants aged <6 months in South Africa, 2013-2015

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Influenza-associated illness** | **Medically-attended illnessa** | | **Non-medically-attended illnessb** | |
| **Rate (95% CI)** | **Number (95% CI)** | **Rate (95% CI)** | **Number (95% CI)** |
| **Infants aged <6 months** | | | | |
| ILI (mild) | 1,635 (1,112-2,158) | 9,689 (6,589-1,2789) | 5,520 (3,754-7,286) | 32,714 (22,246-43,182) |
| SARI (severe-non-fatal) | 365 (248-482) | 2,163 (1,471-2,855) | 384 (261-507) | 2,276 (1,548-3,004) |
| SARI (fatal) | 8 (6-11) | 50 (34-66) | 8 (6-11) | 50 (34-66) |
| **Individuals aged 5-64 years without HIV, PTB or UMC** | | | | |
| ILI (mild) | 1,797 (1,312-2,282) | 519,656 (379,349-659,963) | 5,126 (3,742-6,510) | 1,482,699 (1,082,370-1,883,028) |
| SARI (severe-non-fatal) | 5 (4-7) | 1,532 (1,118-1,946) | 5 (4-7) | 1,590 (1,161-2,019) |
| SARI (fatal) | 0.1 (<0.1-0.2) | 25 (18-32) | 0.1 (<0.1-0.2) | 23 (17-29) |

Abbreviations: CI: confidence intervals; ILI: influenza-like-illness; SARI: severe acute respiratory illness.

Rates reported per 100,000 person year.

a Medically-attended deaths defined as occurring in hospital.

b Non-medically-attended deaths defined as occurring out of the hospital.

**Table S13:** Estimated mean annual number of individuals within potential target risk groups for influenza immunization by co-infections and co-morbidities (i.e. HIV, TB and UMC – defined as risk conditions) in South Africa, 2013-2015

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk groupsa** | **Number** | **% of total in risk conditions** | **% of total** |
| **Children aged 6-59 months** | | | |
| No conditions | 4,623,682 | Not applicable | 88.9 |
| HIV only | 61,368 | 10.6 | 1.2 |
| PTB only | 2,488 | 0.4 | 0.1 |
| UMC only | 504,531 | 87.0 | 9.7 |
| HIV and PTB only | 67 | <0.1 | <0.1 |
| HIV and UMC only | 11,407 | 2.0 | 0.2 |
| PTB and UMC only | 269 | <0.1 | <0.1 |
| HIV and PTB and UMC | 12 | <0.1 | <0.1 |
| Total risk conditions | 580,142 | 100.0 | 11.2 |
| **Individuals aged 5-64 years with HIV, PTB or UMC (excluding pregnant women)** | | | |
| HIV only | 3,654,184 | 23.7 | Not applicable |
| PTB only | 128,535 | 0.8 | Not applicable |
| UMC only | 8,862,228 | 57.5 | Not applicable |
| HIV and PTB only | 117,065 | 0.8 | Not applicable |
| HIV and UMC only | 2,576,161 | 16.7 | Not applicable |
| PTB and UMC only | 4,527 | <0.1 | Not applicable |
| HIV and PTB and UMC | 82,529 | 0.5 | Not applicable |
| Total risk conditions | 15,425,229 | 100.0 | Not applicable |
| **Individuals aged ≥65 years** | | | |
| No conditions | 1,281,699 | Not applicable | 42.5 |
| HIV only | 5,738 | 0.3 | 0.2 |
| PTB only | 5,594 | 0.3 | 0.2 |
| UMC only | 1,661,266 | 95.9 | 55.1 |
| HIV and PTB only | 50 | <0.1 | <0.1 |
| HIV and UMC only | 53,014 | 3.1 | 1.8 |
| PTB and UMC only | 7,049 | 0.4 | 0.2 |
| HIV and PTB and UMC | 467 | <0.1 | <0.1 |
| Total risk conditions | 1,733,178 | 100.0 | 57.5 |
| **Pregnant women** | | | |
| No conditions | 564,907 | Not applicable | 61.0 |
| HIV only | 119,503 | 33.2 | 12.9 |
| PTB only | 3,363 | 0.9 | 0.4 |
| UMC only | 152,500 | 42.3 | 16.5 |
| HIV and PTB only | 3,129 | 0.9 | 0.3 |
| HIV and UMC only | 79,792 | 22.1 | 8.6 |
| PTB and UMC only | 115 | <0.1 | <0.1 |
| HIV and PTB and UMC | 2,089 | 0.6 | 0.2 |
| Total risk conditions | 360,491 | 100.0 | 39.0 |
| **Individuals aged ≥6 months with HIV, PTB or UMC (including pregnant women)** | | | |
| HIV only | 3,840,793 | 21.2 | Not applicable |
| PTB only | 139,980 | 0.8 | Not applicable |
| UMC only | 11,180,525 | 61.8 | Not applicable |
| HIV and PTB only | 120,311 | 0.7 | Not applicable |
| HIV and UMC only | 2,720,374 | 15.0 | Not applicable |
| PTB and UMC only | 11,960 | 0.1 | Not applicable |
| HIV and PTB and UMC | 85,097 | 0.5 | Not applicable |
| Total risk conditions | 18,099,040 | 100.0 | Not applicable |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

a Categories are mutually exclusive.

**Table S14:** Estimated mean annual rates and number of total (medically and non-medically-attended) influenza-associated mild illness (any illness) among potential target risk groups for influenza immunization by co-infections and co-morbidities (i.e. HIV, TB and UMC – defined as risk conditions) in South Africa, 2013-2015

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk groupsa** | **Number** | **% of total in risk conditions** | **% of total** |
| **Children aged 6-59 months** | | | |
| No conditions | 1,108,892 | Not applicable | 88.9 |
| HIV only | 14,718 | 10.6 | 1.2 |
| PTB only | 597 | 0.4 | 0.1 |
| UMC only | 121,002 | 87.0 | 9.7 |
| HIV and PTB only | 16 | <0.1 | <0.1 |
| HIV and UMC only | 2,735 | 2.0 | 0.2 |
| PTB and UMC only | 64 | <0.1 | <0.1 |
| HIV and PTB and UMC | 3 | <0.1 | <0.1 |
| Total risk conditions | 139,135 | 100.0 | 11.2 |
| **Individuals aged 5-64 years with HIV, PTB or UMC (excluding pregnant women)** | | | |
| HIV only | 744,220 | 23.7 | Not applicable |
| PTB only | 26,178 | 0.8 | Not applicable |
| UMC only | 1,804,903 | 57.5 | Not applicable |
| HIV and PTB only | 23,842 | 0.8 | Not applicable |
| HIV and UMC only | 524,667 | 16.7 | Not applicable |
| PTB and UMC only | 922 | <0.1 | Not applicable |
| HIV and PTB and UMC | 16,808 | 0.5 | Not applicable |
| Total risk conditions | 3,141,540 | 100.0 | Not applicable |
| **Individuals aged ≥65 years** | | | |
| No conditions | 34,718 | Not applicable | 42.5 |
| HIV only | 156 | 0.3 | 0.2 |
| PTB only | 152 | 0.3 | 0.2 |
| UMC only | 45,002 | 95.9 | 55.1 |
| HIV and PTB only | 1 | <0.1 | <0.1 |
| HIV and UMC only | 1,435 | 3.1 | 1.8 |
| PTB and UMC only | 190 | 0.4 | 0.2 |
| HIV and PTB and UMC | 13 | <0.1 | <0.1 |
| Total risk conditions | 46,949 | 100.0 | 57.5 |
| **Pregnant women** | | | |
| No conditions | 87,617 | Not applicable | 61.0 |
| HIV only | 18,535 | 33.2 | 12.9 |
| PTB only | 522 | 0.9 | 0.4 |
| UMC only | 23,652 | 42.3 | 16.5 |
| HIV and PTB only | 485 | 0.9 | 0.3 |
| HIV and UMC only | 12,376 | 22.1 | 8.6 |
| PTB and UMC only | 18 | <0.1 | <0.1 |
| HIV and PTB and UMC | 324 | 0.6 | 0.2 |
| Total risk conditions | 55,912 | 100.0 | 39.0 |
| **Individuals aged ≥6 months with HIV, PTB or UMC (including pregnant women)** | | | |
| HIV only | 777,629 | 23.0 | Not applicable |
| PTB only | 27,449 | 0.8 | Not applicable |
| UMC only | 1,994,559 | 58.9 | Not applicable |
| HIV and PTB only | 24,344 | 0.7 | Not applicable |
| HIV and UMC only | 541,213 | 16.0 | Not applicable |
| PTB and UMC only | 1,194 | <0.1 | Not applicable |
| HIV and PTB and UMC | 17,148 | 0.5 | Not applicable |
| Total risk conditions | 3,383,536 | 100.0 | Not applicable |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

a Categories are mutually exclusive.

**Table S15:** Estimated mean annual rates and number of total (medically and non-medically-attended) influenza-associated severe-non-fatal illness (any illness) among potential target risk groups for influenza immunization by co-infections and co-morbidities (i.e. HIV, TB and UMC – defined as risk conditions) in South Africa, 2013-2015

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk groupsa** | **Number** | **% of total in risk conditions** | **% of total** |
| **Children aged 6-59 months** | | | |
| No conditions | 18,123 | Not applicable | 68.6 |
| HIV only | 1,360 | 16.4 | 5.2 |
| PTB only | 55 | 0.7 | 0.2 |
| UMC only | 6,448 | 77.6 | 24.4 |
| HIV and PTB only | 5 | 0.1 | 0.0 |
| HIV and UMC only | 418 | 5.0 | 1.6 |
| PTB and UMC only | 19 | 0.2 | 0.1 |
| HIV and PTB and UMC | 2 | <0.1 | <0.1 |
| Total risk conditions | 8,307 | 100.0 | 31.4 |
| **Individuals aged 5-64 years with HIV, PTB or UMC (excluding pregnant women)** | | | |
| HIV only | 21,321 | 40.3 | Not applicable |
| PTB only | 427 | 0.8 | Not applicable |
| UMC only | 7,811 | 14.8 | Not applicable |
| HIV and PTB only | 1,000 | 1.9 | Not applicable |
| HIV and UMC only | 21,000 | 39.7 | Not applicable |
| PTB and UMC only | 332 | 0.6 | Not applicable |
| HIV and PTB and UMC | 984 | 1.9 | Not applicable |
| Total risk conditions | 52,875 | 100.0 | Not applicable |
| **Individuals aged ≥65 years** | | | |
| No conditions | 4,756 | Not applicable | 20.7 |
| HIV only | 256 | 1.4 | 1.1 |
| PTB only | 273 | 1.5 | 1.2 |
| UMC only | 14,906 | 81.9 | 64.9 |
| HIV and PTB only | 20 | 0.1 | 0.1 |
| HIV and UMC only | 2,364 | 13.0 | 10.3 |
| PTB and UMC only | 204 | 1.1 | 0.9 |
| HIV and PTB and UMC | 187 | 1.0 | 0.8 |
| Total risk conditions | 18,210 | 100.0 | 79.3 |
| **Pregnant women** | | | |
| No conditions | 3,394 | Not applicable | 37.8 |
| HIV only | 2,201 | 39.4 | 24.5 |
| PTB only | 186 | 3.3 | 2.1 |
| UMC only | 1,261 | 22.6 | 14.1 |
| HIV and PTB only | 166 | 3.0 | 1.8 |
| HIV and UMC only | 1,636 | 29.3 | 18.2 |
| PTB and UMC only | 7 | 0.1 | 0.1 |
| HIV and PTB and UMC | 124 | 2.2 | 1.4 |
| Total risk conditions | 5,581 | 100.0 | 62.2 |
| **Individuals aged ≥6 months with HIV, PTB or UMC (including pregnant women)** | | | |
| HIV only | 25,138 | 29.6 | Not applicable |
| PTB only | 941 | 1.1 | Not applicable |
| UMC only | 30,426 | 35.8 | Not applicable |
| HIV and PTB only | 1,191 | 1.4 | Not applicable |
| HIV and UMC only | 25,418 | 29.9 | Not applicable |
| PTB and UMC only | 562 | 0.7 | Not applicable |
| HIV and PTB and UMC | 1,297 | 1.5 | Not applicable |
| Total risk conditions | 84,973 | 100.0 | Not applicable |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

a Categories are mutually exclusive.

**Table S16:** Estimated mean annual rates and number of total (in- and out-of-hospital) influenza-associated deaths among potential target risk groups for influenza immunization by co-infections and co-morbidities (i.e. HIV, TB and UMC – defined as risk conditions) in South Africa, 2013-2015

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk groupsa** | **Number** | **% of total in risk conditions** | **% of total** |
| **Children aged 6-59 months** | | | |
| No conditions | 469 | Not applicable | 54.0 |
| HIV only | 153 | 38.3 | 17.6 |
| PTB only | 6 | 1.5 | 0.7 |
| UMC only | 116 | 29.1 | 13.4 |
| HIV and PTB only | 1 | 0.3 | 0.1 |
| HIV and UMC only | 120 | 30.1 | 13.8 |
| PTB and UMC only | 3 | 0.8 | 0.4 |
| HIV and PTB and UMC | 0 | 0.0 | 0.0 |
| Total risk conditions | 399 | 100.0 | 46.0 |
| **Individuals aged 5-64 years with HIV, PTB or UMC (excluding pregnant women)** | | | |
| HIV only | 2,216 | 38.7 | Not applicable |
| PTB only | 101 | 1.8 | Not applicable |
| UMC only | 430 | 7.5 | Not applicable |
| HIV and PTB only | 157 | 2.7 | Not applicable |
| HIV and UMC only | 2,626 | 45.9 | Not applicable |
| PTB and UMC only | 11 | 0.2 | Not applicable |
| HIV and PTB and UMC | 186 | 3.2 | Not applicable |
| Total risk conditions | 5,727 | 100.0 | Not applicable |
| **Individuals aged ≥65 years** | | | |
| No conditions | 1,539 | Not applicable | 37.0 |
| HIV only | 19 | 0.7 | 0.5 |
| PTB only | 22 | 0.8 | 0.5 |
| UMC only | 1,655 | 63.2 | 39.8 |
| HIV and PTB only | 0 | 0.0 | 0.0 |
| HIV and UMC only | 888 | 33.9 | 21.4 |
| PTB and UMC only | 14 | 0.5 | 0.3 |
| HIV and PTB and UMC | 22 | 0.8 | 0.5 |
| Total risk conditions | 2,620 | 100.0 | 63.0 |
| **Pregnant women** | | | |
| No conditions | 31 | Not applicable | 20.8 |
| HIV only | 40 | 33.9 | 26.8 |
| PTB only | 2 | 1.7 | 1.3 |
| UMC only | 28 | 23.7 | 18.8 |
| HIV and PTB only | 4 | 3.1 | 2.4 |
| HIV and UMC only | 39 | 33.1 | 26.2 |
| PTB and UMC only | 2 | 1.7 | 1.3 |
| HIV and PTB and UMC | 3 | 2.9 | 2.3 |
| Total risk conditions | 118 | 100.0 | 79.2 |
| **Individuals aged ≥6 months with HIV, PTB or UMC (including pregnant women)** | | | |
| HIV only | 2,428 | 27.4 | Not applicable |
| PTB only | 131 | 1.5 | Not applicable |
| UMC only | 2,229 | 25.1 | Not applicable |
| HIV and PTB only | 162 | 1.8 | Not applicable |
| HIV and UMC only | 3,673 | 41.4 | Not applicable |
| PTB and UMC only | 30 | 0.3 | Not applicable |
| HIV and PTB and UMC | 211 | 2.4 | Not applicable |
| Total risk conditions | 8,864 | 100.0 | Not applicable |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

a Categories are mutually exclusive.

**Table S17:** Estimated mean annual number of individuals and influenza-associated illness (any illness) among infants aged <6 months by co-infections and co-morbidities (i.e. HIV, TB and UMC – defined as risk conditions) in South Africa, 2013-2015

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | **Number** | **% of total in risk conditions** | **% of total** |
| **Population** | | | |
| No conditions | 526,588 | Not applicable | 88.9 |
| HIV only | 6,989 | 10.6 | 1.2 |
| PTB only | 283 | 0.4 | 0.1 |
| UMC only | 57,461 | 87.0 | 9.7 |
| HIV and PTB only | 8 | <0.1 | <0.1 |
| HIV and UMC only | 1,299 | 2.0 | 0.2 |
| PTB and UMC only | 31 | <0.1 | <0.1 |
| HIV and PTB and UMC | 1 | <0.1 | <0.1 |
| Total risk conditions | 66,072 | 100.0 | 11.2 |
| **Influenza-associated mild illness** | | | |
| No conditions | 138,149 | Not applicable | 88.9 |
| HIV only | 1,834 | 10.6 | 1.2 |
| PTB only | 75 | 0.4 | 0.1 |
| UMC only | 15,075 | 87.0 | 9.7 |
| HIV and PTB only | 2 | <0.1 | <0.1 |
| HIV and UMC only | 341 | 2.0 | 0.2 |
| PTB and UMC only | 8 | <0.1 | <0.1 |
| HIV and PTB and UMC | 0 | <0.1 | <0.1 |
| Total risk conditions | 17,335 | 100.0 | 11.2 |
| **Influenza-associated severe-non-fatal illness** | | | |
| No conditions | 4,749 | Not applicable | 68.6 |
| HIV only | 355 | 16.3 | 5.1 |
| PTB only | 14 | 0.6 | 0.2 |
| UMC only | 1,688 | 77.6 | 24.4 |
| HIV and PTB only | 2 | 0.1 | <0.1 |
| HIV and UMC only | 110 | 5.1 | 1.6 |
| PTB and UMC only | 5 | 0.2 | 0.1 |
| HIV and PTB and UMC | 0 | <0.1 | <0.1 |
| Total risk conditions | 2,174 | 100.0 | 31.4 |
| **Influenza-associated death** | | | |
| No conditions | 194 | Not applicable | 53.6 |
| HIV only | 65 | 38.7 | 18.0 |
| PTB only | 3 | 1.8 | 0.8 |
| UMC only | 49 | 29.2 | 13.5 |
| HIV and PTB only | 0 | <0.1 | <0.1 |
| HIV and UMC only | 50 | 29.8 | 13.8 |
| PTB and UMC only | 1 | 0.6 | 0.3 |
| HIV and PTB and UMC | 0 | <0.1 | <0.1 |
| Total risk conditions | 168 | 100.0 | 46.4 |

Abbreviations: HIV: human immunodeficiency virus; PTB: pulmonary tuberculosis; UMC: underlying medical conditions, including chronic lung, kidney, liver or cardiac disease, diabetes mellitus, and asthma as well as malnutrition and prematurity only among children aged <5 years; CI: confidence intervals.

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