THE LANCET Infectious Diseases

Supplementary webappendix

This webappendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Adenis AA, Valdes A, Cropet C, et al. Burden of HIV-associated histoplasmosis compared with tuberculosis in Latin America: a modelling study. *Lancet Infect Dis* 2018; published online August 23. http://dx.doi.org/10.1016/S1473-3099(18)30354-2.

Appendix

Summary in Spanish

Título : La Carga de la histoplasmosis asociada al VIH en América Latina y su comparación con la carga de la tuberculosis: resultados de un estudio de modelación.

Antecedentes :

Las infecciones fúngicas siguen siendo un importante contribuyente de las infecciones oportunistas que afectan a las personas que viven con el VIH (PLVIH). Entre ellas, la histoplasmosis se considera una enfermedad desatendida, la cual a menudo se diagnostica erróneamente como tuberculosis (TB) y es responsable de numerosas muertes en América Latina. El objetivo de este estudio fue estimar la carga de la histoplasmosis asociada al VIH en países de América Latina y compararla con la carga tuberculosis.

Métodos :

Para este estudio de modelación, nosotros estimamos la prevalencia de exposición a *Histoplasma capsulatum*, la incidencia anual de casos de histoplasmosis asociada a PLHIV y el número de muertes para el año 2012 en países de América Latina, esto basado en estudios históricos de reactividad cutánea a la histoplasmina en población general, utilizando una dilución de antígeno mayor a 1/10. Los estudios fueron identificados mediante búsqueda bibliográfica. Los datos sobre la tuberculosis asociada al VIH se extrajeron de los informes de la OMS, y la información sobre desenlaces de las personas con VIH se extrajeron del informe de ONUSIDA correspondiente al año 2012. Nosotros incluimos sistemáticamente cálculos de incertidumbre en cada uno de los pasos en el proceso de estimación.

Resultados :

De 1310 artículos identificados al 1 de junio del año 2015, fueron incluidos 24 artículos en este estudio, los cuales representaron 129 estudios de reactividad cutánea a la histoplasmina realizados en población general de países de América Latina. Para el año 2012, estimamos un rango de 6710 (95% IC: [5680-7867])-15657 [13254-18357] casos sintomáticos de histoplasmosis asociada a PLHIV en América Latina. Las áreas críticas para la prevalencia de histoplasmosis (>30%) e incidencia (>1,5 casos por 100 PLHIV) fueron: América Central, el norte de América del Sur y Argentina. Acuerdo a los escenarios más realistas, estimamos un rango de 671 [568-787]-9394 [7952-11014] muertes relacionadas con la histoplasmosis, en comparación con las 5062 [3777-6405] muertes asociadas con la tuberculosis, en América Latina.

Interpretación :

Nuestras estimaciones de incidencia de histoplasmosis y muertes asociadas son altas y consistentes con los datos publicados. Por primera vez se estimó que la carga de la histoplasmosis es equivalente en incidencia e incluso mayor en muertes cuando fue comparada con la carga de la tuberculosis en PLHIV de América Latina.

Fondos : Ninguno

Supplementary text

Methods

Literature review

Audrey Valdes and Antoine Adenis performed the literature review and selection of articles.

The search terms were « histoplasmin» or « histoplasmosis prevalence » associated with « South America », « Central America », « Latin America » or any country name among the following: Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, French Guiana, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Peru, Paraguay, El Salvador, Suriname, Uruguay and Venezuela. All types of published articles in any language were considered without time limitations since we assumed that, in endemic areas, the prevalence of this environmental fungal pathogen remained stable over time.

We abstracted the following data from each article and included a study when all were present: name of the country and region (part of Central or South America), absolute number of persons tested and number of persons with a positive histoplasmin skin test, dilution level of histoplasmin antigen used for skin testing >1/10 to avoid false positives due to cross-reactivity (range of dilution kept between 1/100 and 1/1,000) and population tested. We included only studies that involved the general population and not a specific subgroup. However, when the only study from a given country involved a specific population subgroup, we included it to compute country's estimates.

Among 1,310 articles identified as of June 1, 2015, 174 articles were considered eligible for the study based on abstracts. On review of full articles, only 77 were considered eligible based on the availability of information required to calculate histoplasmosis prevalence. At the end of the selection process, 24 articles were included for the study (Technical Appendix 1); 31 records were excluded because they did not meet the inclusion criteria and another 22 records were excluded because information was already available elsewhere in atlases or reviews.

Statistical analysis

Histoplasmosis data and calculation of estimates

Prevalence of previous exposure to Histoplasma capsulatum in the general population

For Guatemala, Guyana and Suriname, prevalence of histoplasmin skin test positivity was estimated using data from studies performed on hospitalized patients of varying ages. Similarly, for Chile, studies performed on children and students were used to estimate prevalence of histoplasmin skin test positivity. Costa Rica, Nicaragua and El Salvador had no general population estimations available, so histoplasmin skin test prevalence was approximated using the mean of the bordering countries' estimates based on the similarity of environmental conditions and a related assumption that the geographical distribution of histoplasmosis prevalence should be similar as well. Estimates of the lower and higher bounds for Costa Rica, Nicaragua and El Salvador corresponded to the lowest and highest bounds of the bordering countries' estimates.

Histoplasmosis incidence in PLHIV

General assumptions

Because incidence data are scarce, we used the following assumptions to estimate histoplasmosis incidence. First, an estimated disease duration was calculated using the prevalence population relation $P_p = \frac{I_d E_i(D)}{1 + I_d E_i(D)}$ where P_p denotes the prevalence, I_d incidence density, and $E_i(D)$ expected value of duration of histoplasmosis obtained from an incidence (i) case series. It was assumed that the duration of histoplasmosis was constant and that the population was in a steady-state (Freeman J *& al.*, *Am J Epidemiol.*, 1980). Secondly, for incidence densities (I_d) smaller than 0.10, cumulative incidence (I_c) is a good approximation of the incidence density. As an example, for I_d=0.1, using the relation $I_c = 1 - e^{-I_d}$, I_c=0.095, which for practical purposes could be rounded to 0.1. This allowed us to proceed with further computations to estimate the burden of histoplasmosis.

To our knowledge, only two published histoplasmosis incidence calculations are based on prospective PLHIV cohorts (Nacher M *& al., Am J Trop Med Hyg.*, 2011) (McKinsey DS *& al.*, *Clin Infect Dis*., 1997). In the French Guiana PLHIV cohort, the duration of histoplasmosis was estimated at 0.321 years, considering an annual histoplasmosis incidence density of 1.5 per 100 HIV-infected person-years and a histoplasmosis prevalence in the general population of 32.5% (Nacher M *& al., Am J Trop Med Hyg.*, 2011) (Floch H., *Mycopathologia et mycologia applicata*, 1957). This meant that, on average, duration of histoplasmosis was estimated at 3.9 months (12*0.321). This estimate was used in the overall model, as it is the only one available for Latin America and concordant with an estimate of 0.395 years calculated in a North American PLHIV cohort (McKinsey DS *& al.*, *Clin Infect Dis*., 1997).

In order to perform calculations in the population subgroup represented by PLHIV, we assumed that histoplasmosis prevalence in PLHIV was similar to estimates obtained from histoplasmin skin test prevalence studies performed in the general population.

Moreover, accuracy in histoplasmosis incident cases estimates among PLHIV required taking into account that histoplasmosis is mainly an asymptomatic and spontaneously self-limited infection in immunocompetent people and is classically reported to be primarily symptomatic and fatal without appropriate antifungal therapy in PLHIV with a CD4 count <200/mm3 (Adenis AA & al., Curr. Trop. Med. Reports, 2014). As no estimates were available for the number of PLHIV with a CD4 count <200/mm3 in Latin America, we therefore approximated the annual number of incident HIV-associated histoplasmosis symptomatic cases. Several studies based on cohort data have reported that a large proportion of PLHIV starting antiretroviral therapy (ART) with a CD4 count <200/mm3, ranging from 30% (observed in European settings like in French Guiana) to 70% in countries across Latin America (Crabtree-Ramírez B & al., PLoS ONE, 2011) (Bonjour MA & al., AIDS Research and Therapy, 2008) (Piñeirúa A & al., The Lancet Infectious Diseases, 2015) (Vidal JE & al., The Brazilian Journal of Infectious Diseases, 2013) (García JI & aj., AIDS Research and Treatment, 2015). Patients included in these studies were diagnosed with advanced HIV disease (i.e. CD4 count <200/mm3 or

with a history of an AIDS-defining illness), due to late testing or late presentation and subsequently late ART initiation.

Tuberculosis data and calculation of estimates

For French Guiana, we used the published estimate of the number of TB-related deaths among PLHIV (Nacher M, *COREVIH Guyane*, 2013). The number of incident TB cases was estimated from the published incidence density of 0.77 per 100 HIV-infected patients-year (95% CI: 0.45-1.09) according to estimates of the number of PLHIV (Nacher M *& al.*, *Am J Trop Med Hyg*., 2011). The two latter parameters were modeled in the same way as histoplasmosis incidence density in order to express an expected TB incidence number along with a 95% CI.

HIV data and calculation of estimates:

For Brazil, the estimated number of PLHIV was calculated as the mean of the low and high UNAIDS estimates in Brazil. For French Guiana, as the number of PLHIV (all ages) was not available, we assumed a scenario based on a heterosexual HIV transmission and approximate prevalence with the published prevalence of 1.2% in pregnant women for the year 2012 (Nacher M, *COREVIH Guyane*, 2013). As HIV prevalence is quite stable over time, low and high values for HIV prevalence were set at 0.8% and 1.4%, respectively (Adenis A *& al.*, *PLoS Negl Trop Dis.*, 2014). The estimated number of PLHIV (all ages) in French Guiana, lower and upper estimates, were calculated according to the last census reporting 241,922 inhabitants in 2013 (Décret n° 2014-1611, Journal Officiel de la République Française, 2014).

Results

Table 3: Annual number of deaths estimated for symptomatic histoplasmosis cases and reported for tuberculosis cases in people living with HIV, Latin America, 2012

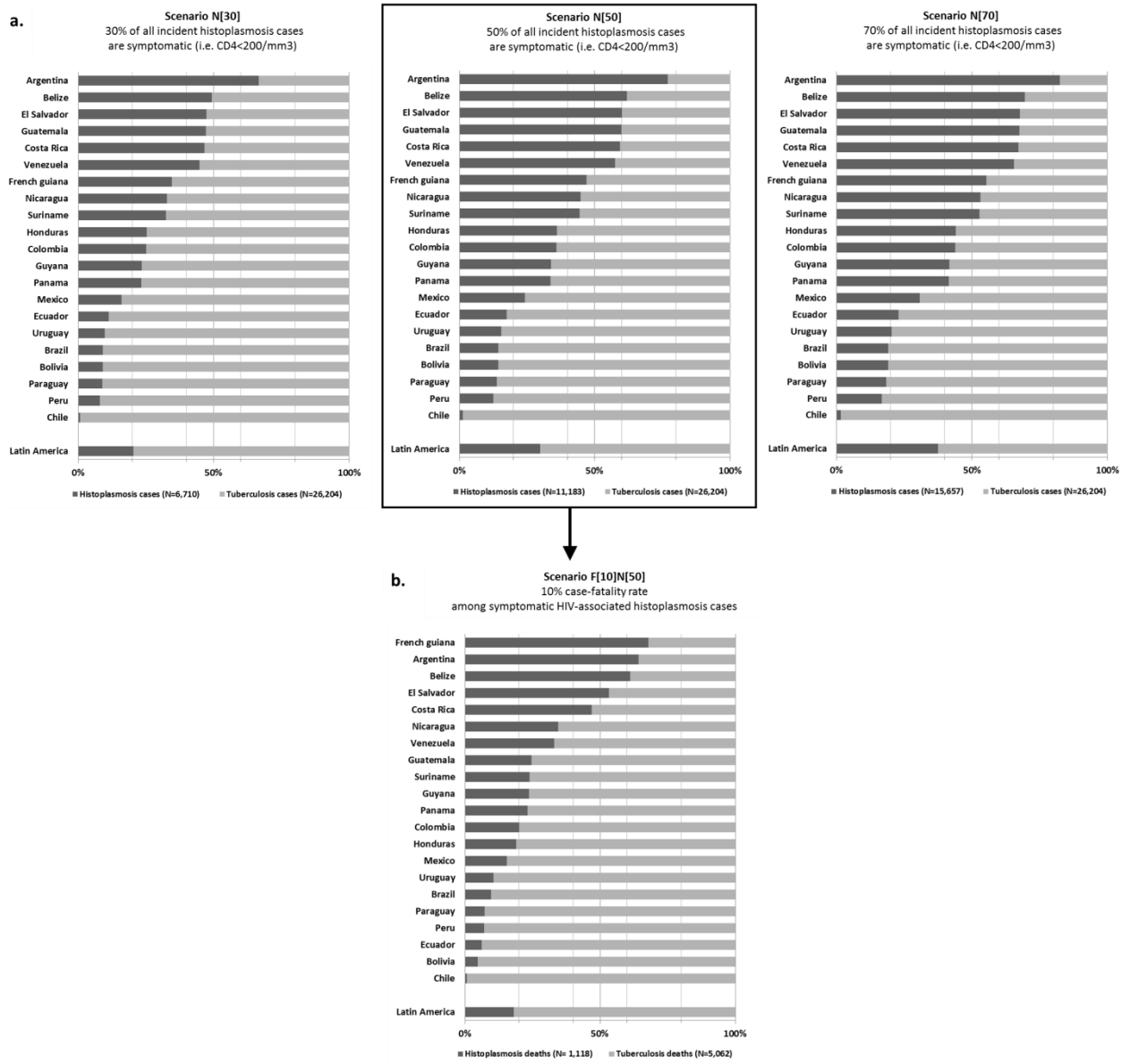
	Histoplasmosis-related deaths annual incidence in PLHIV*			Tuberculosis-related deaths annual incidence in PLHIV†
	10% case-fatality (F[10])			
	N[30] [95%CI]	N[50] [95%CI]	N[70] [95%CI]	N [Low-High]
Argentina	56 [46-67]	93 [77-112]	130 [108-156]	52 [16-110]
Belize	3 [2-4]	5 [3-6]	7 [5-9]	3 [2-4]
Bolivia	4 [3-6]	7 [5-10]	10 [7-13]	140 [100-170]
Brazil	141 [130-154]	236 [216-256]	330 [302-358]	2 200 [1 600-2 800]
Chile	0.04 [0.01-0.07]	0.06 [0.02-0.12]	0.09 [0.02-0.17]	8 [4-14]
Colombia	47 [38-56]	78 [63-93]	110 [89-131]	310 [230-400]
Costa Rica	5 [5-6]	9 [8-10]	12 [11-14]	10 [8-13]
Ecuador	15 [10-23]	25 [17-38]	36 [24-53]	390 [320-460]
El Salvador	20 [11-35]	33 [19-58]	46 [27-82]	29 [20-39]
French Guiana	1 [1-2]	2 [2-3]	3 [2-4]	1 [NA-NA]
Guatemala	80 [50-130]	134 [83-216]	187 [117-303]	410 [340-480]
Guyana	6 [3-11]	10 [6-18]	14 [8-25]	33 [21-48]
Honduras	16 [13-18]	26 [22-30]	36 [31-43]	110 [76-150]
Mexico	48 [42-55]	79 [71-91]	111 [99-127]	430 [330-540]
Nicaragua	5 [4-7]	9 [7-12]	13 [9-17]	17 [13-22]
Panama	9 [7-10]	14 [11-17]	20 [16-24]	47 [35-61]
Paraguay	3 [2-4]	5 [3-7]	6 [4-9]	57 [46-69]
Peru	21 [10-39]	35 [17-65]	48 [23-91]	450 [340-570]
Suriname	3 [3-3]	5 [4-5]	7 [6-7]	15 [11-19]
Uruguay	1 [1-2]	2 [2-3]	3 [3-4]	20 [15-26]
Venezuela	97 [73-125]	162 [121-209]	227 [170-292]	330 [250-410]
Total Latin America	671 [568-787]	1 118 [947-1 311]	1 566 [1 325-1 836]	5 062 [3 777-6 405]

PLHIV: People living with HIV; 95% CI: 95% Monte Carlo confidence interval

* One case-fatality rate scenario (F[10]) corresponding to 10% case-fatality rate) was combined with three scenarios of the estimated number of symptomatic HIV-associated histoplasmosis cases (N[30], N[50], N[70] corresponding to 30%, 50%, 70% of the estimated annual number of HIV-associated histoplasmosis cases, symptomatic and asymptomatic, having a CD4 count <200/mm3). All data were estimated for the year 2012. The median [2.5th and 97.5th percentiles] were presented for each estimates.

† Tuberculosis-related deaths were extracted from the World Health Organization outcomes tables of the year 2012. For French Guiana, information was given by the Public Health Surveillance authorities.

Figure 4: Comparison of the number of incident cases (a.) and the number of deaths (b.) estimated for symptomatic histoplasmosis and reported for tuberculosis in people living with HIV, Latin America, 2012.



a. The x axis represented the ratio (%) of the estimated number of cases associated with symptomatic histoplasmosis cases among the number of reported tuberculosis cases combined with the estimated number of symptomatic histoplasmosis cases according to three scenarios of 30% (N[30]), 50% (N[50]) and 70% (N[70]) of the estimated annual number of histoplasmosis cases (asymptomatic and symptomatic) occurring in people living with HIV and having a CD4 count <200/mm3.

b. The x-axis represented the ratio (%) of the estimated number of deaths associated with symptomatic histoplasmosis cases among the number of AIDS-related tuberculosis deaths combined with the estimated number of histoplasmosis-related deaths in people living with HIV.

HIV-associated tuberculosis cases (a.) and deaths (b.) were extracted for all countries from the WHO notifications and outcomes tables of the year 2012.

Supplementary references

Introduction

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Homei A, Worboys M. Fungal Disease in Britain and the United States 1850-2000 Mycoses and Modernity. 2013/11/15 ed. Centre for the History of Science TaM, University of Manchester, England (http://chstm.manchester.ac.uk), editor. Manchester, England: Palgrave Macmillan; 2013. 225 p

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Methods

Literature review

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Histoplasmosis incidence in PLHIV

General assumptions

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McKinsey DS, Spiegel RA, Hutwagner L, Stanford J, Driks MR, Brewer J, et al. Prospective study of histoplasmosis in patients infected with human immunodeficiency virus: incidence, risk factors, and pathophysiology. Clin Infect Dis. 1997;24(6):1195-203

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Bonjour MA, Montagne M, Zambrano M, Molina G, Lippuner C, Wadskier FG, et al. Determinants of late disease-stage presentation at diagnosis of HIV infection in Venezuela: A case-case comparison. AIDS Research and Therapy. 2008;5(1):1-12

Piñeirúa A, Sierra-Madero J, Cahn P, Guevara Palmero RN, Martínez Buitrago E, Young B, et al. The HIV care continuum in Latin America: challenges and opportunities. The Lancet Infectious Diseases. 2015;15(7):833-9

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Tuberculosis data and calculation of estimates

Tuberculosis and HIV notifications and outcomes tables [Internet]. 2013 [Date accessed: 06/01/2015]. Available from: http://apps.who.int/gho/data/view.main.TBHIVWHOREG

Nacher M. Rapport d'activités 2012 COREVIH Guyane. Cayenne: COREVIH, 2013

Nacher M, Adenis A, Adriouch L, Dufour J, Papot E, Hanf M, et al. What is AIDS in the Amazon and the Guianas? Establishing the burden of disseminated histoplasmosis. Am J Trop Med Hyg. 2011;84(2):239-40

HIV data and calculation of estimates:

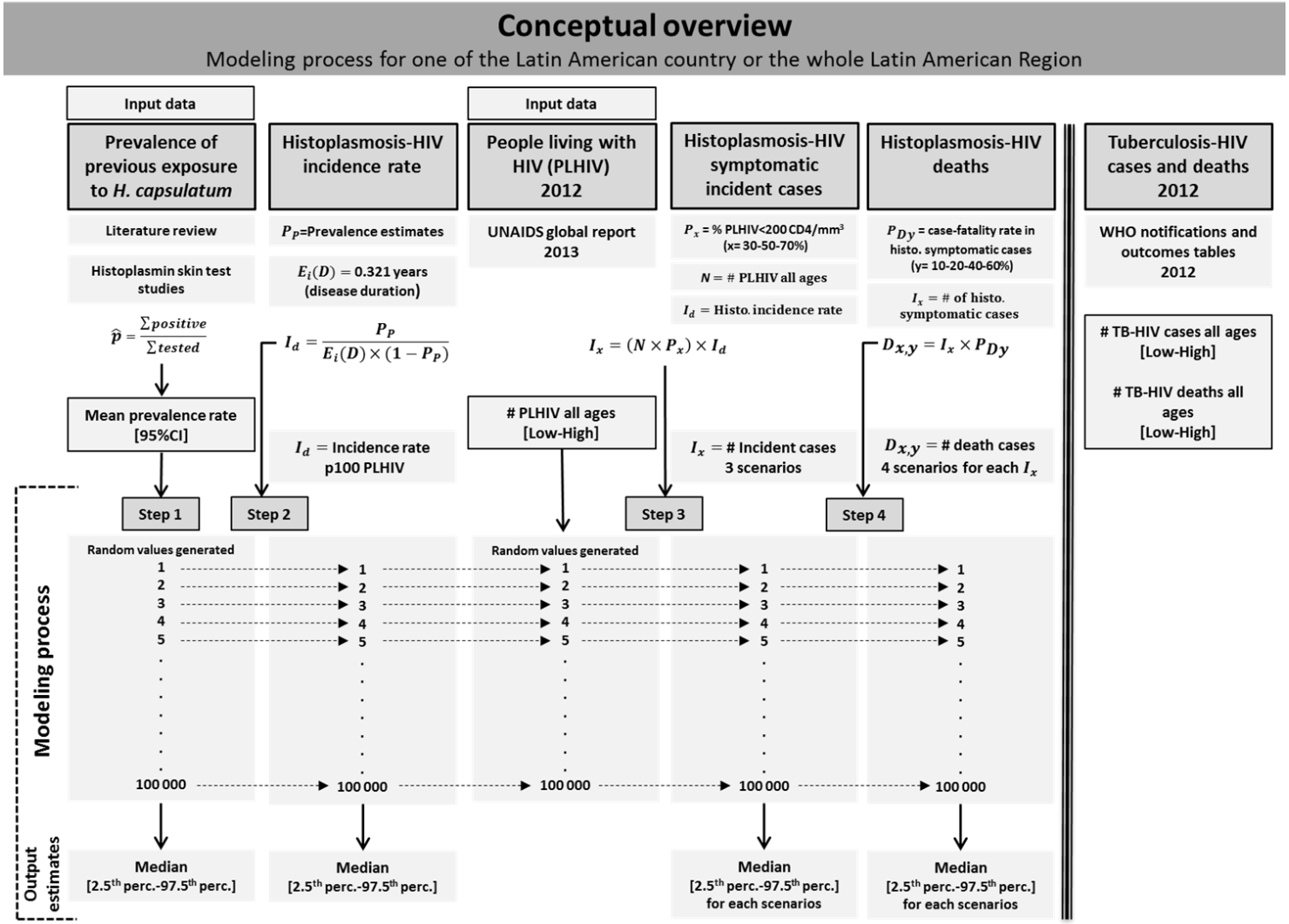
Nacher M. Rapport d'activités 2012 COREVIH Guyane. Cayenne: COREVIH, 2013

Adenis A, Nacher M, Hanf M, Vantilcke V, Boukhari R, Blachet D, et al. HIV-associated histoplasmosis early mortality and incidence trends: from neglect to priority. PLoS Negl Trop Dis. 2014;8(8):e3100

Journal-Officiel-de-la-République-Française. Décret n° 2014-1611 du 24 décembre 2014 authentifiant les chiffres des populations de métropole, des départements d'outre-mer de la Guadeloupe, de la Guyane, de la Martinique et de La Réunion, de Saint-Barthélemy, de Saint-Martin et de Saint-Pierre-et-Miquelon. Paris 2014

Supplementary statistics

Conceptual overview of the modeling process



Literature review results

Countries	Region	Study Year	People tested (n)	Positive skin test prevalence (%)	Histoplasmin antigen dilution	Population explored	References	References #
Argentina	Tucuman	1992	224	53,6	1/100	General	van Gelderen de Komaid A, Duŕan EL, Madero AM, Carizo V. Histoplasmosis in northwestern Argentina. Epidemiological survey of Chuscha and La Higuera in the province of Tucumán. Eur J Epidemiol. mars 1992;8(2):206-10.	1
Argentina	Tucuman	1995	229	27,3	1/100	General	van Gelderen de Komaid A, Durán EL. Histoplasmosis in northwestern Argentina. II: Prevalence of Histoplasmosis capsulati and paracoccidioidomycosis in the population south of Chuscha, Gonzalo and Potrero in the province of Tucuman. Mycopathologia. 1995;129(1):17-23.	2
Argentina	Tucuman	1999	287	33,8	1/100	General	van Gelderen de Komaid A, Durán E, Borges de Kestelman I. Histoplasmosis and Paracoccidioidomycosis in northwestern Argentina III. Epidemiological survey in Vipos, La Toma, and Choromoro - Trancas, Tucumán, Argentina. Eur J Epidemiol. avr 1999;15(4):383-8.	3
Belize	Corozal	1978	79	49,4	1/100	General	Quinones F, Koplan JP, Pike L, Staine F, Ajello L. Histoplasmosis in Belize, Central America. Am J Trop Med Hyg. mai 1978;27(3):558-61.	4

Bolivia	**Beni**	**1967**	**805**	**51,5**	**1/100**	**General**	**Omran, A. R., McEwen, W. J., and Zaki, M. H., 1967. Epidemiological studies in Bolivia. Final epidemiological report for the Peace Corps. RISM Boliva Project, Research Institute for the Study of Man, pp. 37-99**	**5**
Bolivia	**Chuquisaca**	**1967**	**249**	**5**	**1/100**	**General**	**Omran, A. R., McEwen, W. J., and Zaki, M. H., 1967. Epidemiological studies in Bolivia. Final epidemiological report for the Peace Corps. RISM Boliva Project, Research Institute for the Study of Man, pp. 37-99**	**5**
Bolivia	**La Paz**	**1964**	**110**	**9,9**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319**	**6**
Bolivia	**La Paz**	**1967**	**807**	**13,6**	**1/100**	**General**	**Omran, A. R., McEwen, W. J., and Zaki, M. H., 1967. Epidemiological studies in Bolivia. Final epidemiological report for the Peace Corps. RISM Boliva Project, Research Institute for the Study of Man, pp. 37-99**	**5**
Bolivia	**La Paz**	**1967**	**537**	**0,8**	**1/100**	**General**	**Omran, A. R., McEwen, W. J., and Zaki, M. H., 1967. Epidemiological studies in Bolivia. Final epidemiological report for the Peace Corps. RISM Boliva Project, Research Institute for the Study of Man, pp. 37-99**	**5**
Bolivia	**Oruro**	**1967**	**52**	**5,8**	**1/100**	**General**	**Omran, A. R., McEwen, W. J., and Zaki, M. H., 1967. Epidemiological studies in Bolivia. Final epidemiological**	**5**

							report for the Peace Corps. RISM Boliva Project, Research Institute for the Study of Man, pp. 37-99	
Bolivia	Santa cruz	1964	207	26,1	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319	6
Brazil	Alagoas	1990	107	14	1/1000	General	Santos MC, Pedrosa CM. Epidemiologic survey with histoplasmin and paracoccidioidine in Arapiraca-Alagoas. Rev Soc Bras Med Trop. déc 1990;23(4):213-5	7
Brazil	Amapa	1976	109	42,2	1/1000	General	Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.	8
Brazil	Amazonas	1973	294	40,8	1/100 & 1/500	General	Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.	8
Brazil	Amazonas	1978	495	50,1	1/1000	General	Mok WY, Netto CF. Paracoccidioidin and histoplasmin sensitivity in Coari (state of Amazonas), Brazil. Am J Trop Med Hyg. juill 1978;27(4):808-14	9
Brazil	Amazonas	1986	623	18,8	1/1000	General	Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.	8
Brazil	Bahía	1949	119	9,2	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar	6

							1971;20(2):288-319	
Brazil	**Bahía**	**1950**	**557**	**21,9**	**1/100**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Bahía**	**1950**	**230**	**2,6**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Bahía**	**1950**	**108**	**25,2**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319**	**6**
Brazil	**Ceara**	**1990**	**138**	**61,5**	**1/1000**	**General**	**Diógenes MJN, Gonçalves HMG, Mapurunga ACP, Alencar KF, Andrade FB, Nogueira-Queiroz JA. Reações à histoplasmina e paracoccidioidina na Serra de Pereiro (estado do Ceará-Brasil). Revista do Instituto de Medicina Tropical de São Paulo. avr 1990;32(2):116-20.**	**10**
Brazil	**Federal district**	**1972**	**826**	**22,37**	**1/100**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Goias**	**1967**	**114**	**19,2**	**1/1000**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319**	**6**
Brazil	**Goias**	**1968**	**453**	**11**	**1/100**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil.**	**8**

							Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.	
Brazil	**Minas Gerais**	**1970**	**26**	**46,1**	**1/500**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Minas Gerais**	**1970**	**1153**	**11,2**	**1/300**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Minas Gerais**	**1998**	**109**	**44**	**1/500**	**General**	**Silva-Vergara ML, Martínez R. Inquérito epidemiológico com paracoccidioidina e histoplasmina em área agrícola de café em Ibiá, Minas Gerais, Brasil. Rev Iberoam Micol. déc 1998;15(4):294-7.**	**11**
Brazil	**Para**	**1967**	**91**	**27**	**1/1000**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319**	**6**
Brazil	**Para**	**1975**	**374**	**29,1**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Para**	**1988**	**128**	**32**	**1/500**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Pernambuco**	**1967**	**405**	**17**	**1/500**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**

Brazil	**Piaui**	**1975**	**177**	**14,7**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Rio de Janeiro**	**1949**	**176**	**12,5**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319**	**6**
Brazil	**Rio de Janeiro**	**1976**	**370**	**6,8**	**1/100**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Rio de Janeiro**	**1981**	**436**	**6,88**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Rio de Janeiro**	**1985**	**74**	**39,2**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Rio Grande do Norte**	**1978**	**223**	**23,8**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Rio Grande do Sul**	**1949**	**200**	**7**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319**	**6**
Brazil	**Sao Paulo**	**1951**	**110**	**18,7**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil.**	**8**

							Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.	
Brazil	**Sao Paulo**	**1975**	**270**	**20,74**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Sao Paulo**	**1976**	**79**	**8,9**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Sao Paulo**	**1978**	**160**	**25**	**1/1000**	**General**	**Campos CM, Netto CF. [Intradermal paracoccidioidin and histoplasmin reactions in urban inhabitants of Bragança Paulista, State of São Paulo, Brazil]. Rev Inst Med Trop Sao Paulo. oct 1978;20(5):289-92.**	**12**
Brazil	**Sao Paulo**	**1986**	**180**	**21,6**	**1/1000**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Sao Paulo**	**1986**	**377**	**13**	**1/500**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Sao Paulo**	**1995**	**1638**	**18,1**	**1/500**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**
Brazil	**Sao Paulo**	**1996**	**115**	**40**	**1/500**	**General**	**Fava S di C, Netto CF. Epidemiologic surveys of histoplasmin and paracoccidioidin sensitivity in Brazil. Rev Inst Med Trop Sao Paulo. juin 1998;40(3):155-64.**	**8**

Chile	**Viña del Mar**	**1951**	**400**	**0,5**	**1/100**	**Children**	**Edwards PQ, Klaer JH. Worldwide geographic distribution of histoplasmosis and histoplasmin sensitivity. Am J Trop Med Hyg. mars 1956;5(2):235-57.**	**13**
Chile	**Santiago**	**1952**	**95**	**1,1**	**1/100**	**Students**	**Vaccaro H, Ferrada Urzua L. [Inquiry into the sensitivity to coccidioidin and histoplasmin in 95 students and assistants of the Institute of Microbiology and Immunology of the University of Chile]. An Fac Med Montev. juin 1952;37(5-6):151-2.**	**14**
Chile	**Valle de Colliguay**	**1952**	**137**	**0**	**1/100**	**Children**	**Edwards PQ, Klaer JH. Worldwide geographic distribution of histoplasmosis and histoplasmin sensitivity. Am J Trop Med Hyg. mars 1956;5(2):235-57.**	**13**
Chile	**Santa Rosa**	**1953**	**2242**	**0**	**1/1000**	**Children**	**Corona E, Mardones Restat F. Test de sensibilidad cutánea a la histoplasmina en escolares de la unidad sanitaria Santa Rosa. Rev. chil. pediatr. 1953 ; 24(1): 8-10.**	**15**
Colombia	**Antioquia**	**1962**	**760**	**27,8**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319**	**6**
Colombia	**Antioquia**	**1968**	**861**	**17,4**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-320**	**6**
Colombia	**Antioquia**	**1968**	**378**	**26,1**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-321**	**6**

Colombia	**Antioquia**	**1968**	**862**	**29,6**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-322**	**6**
Colombia	**Antioquia**	**1968**	**877**	**17,1**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-323**	**6**
Colombia	**Antioquia**	**1968**	**429**	**13**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-324**	**6**
Colombia	**Cauca**	**1963**	**108**	**0,93**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-325**	**6**
Colombia	**Cauca**	**1963**	**134**	**3**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-326**	**6**
Colombia	**Choco**	**1967**	**171**	**68**	**1/500**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-327**	**6**
Colombia	**Choco**	**1968**	**531**	**19,2**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-328**	**6**
Colombia	**La Guarjira**	**1968**	**740**	**13,5**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar**	**6**

							1971;20(2):288-329	
Colombia	La Guarjira / Cesar	1968	919	19,5	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-330	6
Colombia	Magdalena	1961	1030	40,7	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-331	6
Colombia	Narino	1963	123	57	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-332	6
Colombia	Valle del Cauca	1963	127	51,2	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-333	6
Colombia	Valle del Cauca	1963	170	35	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-334	6
Colombia	Valle del Cauca	1964	169	39,1	1/100	General	Orozco G, Lennox RH, Hayes GS. A study of histoplasmin skin tests among school children in Cali and Candelaria (Valle del Cauca), Colombia. Am J Trop Med Hyg. mai 1964;13:443-8.	16
Ecuador	El oro	1958	126	11,1	1/1000	General	Rodriguez MJD. Revision de las micosis profundas en Ecuador. Rev. Ecuat. Hig. Med. Trop., 1958, 15: 177-188.	17
Ecuador	Esmeraldas	1958	42	21,4	1/1000	General	Rodriguez MJD. Revision de las micosis profundas en	17

							Ecuador. Rev. Ecuat. Hig. Med. Trop., 1958, 15: 177-188.	
Ecuador	Los Rios	1958	113	25,6	1/1000	General	Rodriguez MJD. Revision de las micosis profundas en Ecuador. Rev. Ecuat. Hig. Med. Trop., 1958, 15: 177-188.	17
Ecuador	Los Rios	1958	63	23,8	1/1000	General	Rodriguez MJD. Revision de las micosis profundas en Ecuador. Rev. Ecuat. Hig. Med. Trop., 1958, 15: 177-188.	17
Ecuador	Manabi	1958	154	29,8	1/1000	General	Rodriguez MJD. Revision de las micosis profundas en Ecuador. Rev. Ecuat. Hig. Med. Trop., 1958, 15: 177-188.	17
Guatemala	Amatitlan	1960	61	64	1/100	Patients	Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.	18
Guatemala	Antigua	1960	75	56	1/100	Patients	Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.	18
Guatemala	Escuintla	1960	57	67	1/100	Patients	Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.	18
Guatemala	Guatemala	1960	147	49	1/100	Patients	Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.	18
Guatemala	Huehuetenango	1960	53	23	1/100	Patients	Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.	18

Guatemala	**Mazatenango**	**1960**	**69**	**56**	**1/100**	**Patients**	**Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.**	**18**
Guatemala	**Quezaltenango**	**1960**	**110**	**54**	**1/100**	**Patients**	**Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.**	**18**
Guatemala	**Quirigua**	**1960**	**86**	**81**	**1/100**	**Patients**	**Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.**	**18**
Guatemala	**Tiquisate**	**1960**	**47**	**66**	**1/100**	**Patients**	**Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.**	**18**
Guatemala	**Zacapa**	**1960**	**116**	**58**	**1/100**	**Patients**	**Taylor RL, Dobrovolny CG. The distribution of histoplasmin sensitivity in Guatemala. Am J Trop Med Hyg. sept 1960;9:518-22.**	**18**
Fr. Guiana	**NA**	**1953**	**425**	**32,5**	**1/1000**	**General**	**Edwards PQ, Klaer JH. Worldwide geographic distribution of histoplasmosis and histoplasmin sensitivity. Am J Trop Med Hyg. mars 1956;5(2):235-57.**	**13**
Guyana	**NA**	**1987**	**49**	**47**	**NA**	**Patients &Workers**	**Hay RJ, Rose P, Jones TR. Paracoccidioidin sensitization in Guyana: a preliminary skin test survey in hospitalized patients and laboratory workers. Trans R Soc Trop Med Hyg 1987; 81 : 46 – 48.**	**19**
Honduras	**Choluteca**	**1966**	**21238**	**31,7**	**1/100**	**General**	**Alvarado R. Resultado del Estudio Epidemiológico de la Histoplasmósis y Coccidioidomicosis realizados en la**	**20**

							República de Honduras,C. A. 1962 -1965. Rev. Med. Hond.	
Honduras	Comayagua	1966	548	26,3	1/100	General	Alvarado R. Resultado del Estudio Epidemiológico de la Histoplasmósis y Coccidioidomicosis realizados en la República de Honduras,C. A. 1962 -1965. Rev. Med. Hond.	20
Honduras	Cortés	1966	220	44,1	1/100	General	Alvarado R. Resultado del Estudio Epidemiológico de la Histoplasmósis y Coccidioidomicosis realizados en la República de Honduras,C. A. 1962 -1965. Rev. Med. Hond.	20
Honduras	El Paraíso	1966	20608	48,4	1/100	General	Alvarado R. Resultado del Estudio Epidemiológico de la Histoplasmósis y Coccidioidomicosis realizados en la República de Honduras,C. A. 1962 -1965. Rev. Med. Hond.	20
Honduras	Francisco Morazán	1966	18032	45,3	1/100	General	Alvarado R. Resultado del Estudio Epidemiológico de la Histoplasmósis y Coccidioidomicosis realizados en la República de Honduras,C. A. 1962 -1965. Rev. Med. Hond.	20
Honduras	La Paz	1966	8739	26,2	1/100	General	Alvarado R. Resultado del Estudio Epidemiológico de la Histoplasmósis y Coccidioidomicosis realizados en la República de Honduras,C. A. 1962 -1965. Rev. Med. Hond.	20
Honduras	Santa Bárbara	1966	707	60,7	1/100	General	Alvarado R. Resultado del Estudio Epidemiológico de la Histoplasmósis y Coccidioidomicosis realizados en la República de Honduras,C. A.	20

							1962 -1965. Rev. Med. Hond.	
Honduras	Valle	1966	4805	25	1/100	General	Alvarado R. Resultado del Estudio Epidemiológico de la Histoplasmósis y Coccidioidomicosis realizados en la República de Honduras,C. A. 1962 -1965. Rev. Med. Hond.	20
Mexico	Baja California	1969	5910	22	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319	6
Mexico	Yucatan	1969	150	56	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-320	6
Panama	Islas de San Blás	1964	1038	48,9	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-321	6
Panama	Coclé Province	1964	742	23,7	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-322	6
Panama	Coclé Province	1964	563	30,2	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-323	6
Panama	Herrera Province	1964	440	41,1	1/100	General	Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-324	6

Panama	**Herrera Province**	**1964**	**578**	**24,2**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-325**	**6**
Peru	**Ica**	**1955**	**873**	**1,7**	**1/500**	**General**	**Bouroncle CA, 1955. Sensibilidad a la histoplasmina en algunas localidades del Peru. An. Fac.Med. Limo,38: 1099-1112.**	**21**
Peru	**Loreto**	**1955**	**910**	**37**	**1/500**	**General**	**Bouroncle CA, 1955. Sensibilidad a la histoplasmina en algunas localidades del Peru. An. Fac.Med. Limo,38: 1099-1112.**	**21**
Paraguay	**Asunción**	**1951**	**2206**	**17,5**	**1/100**	**General**	**Gines AR, Gould E, Melgarejo De Talavera MS. [Intradermoreaction with histoplasmin; contribution to the study of histoplasmosis in Paraguay]. Hoja Tisiol. déc 1949;9(4):354-63.**	**22**
Suriname	**NA**	**1953**	**831**	**43,1**	**1/1000**	**Patients**	**Collier WA, De la Fuente AA. Die Histoplasmine-reactie te Paramaribo (Suriname). Nederlandsch Tijdschr. v. Geneesk. 97 (1953) 208-213**	**23**
Uruguay	**Artigas**	**1964**	**3153**	**9,5**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-319**	**6**
Uruguay	**Durazno**	**1964**	**3063**	**23,4**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-320**	**6**
Uruguay	**Florida**	**1964**	**1669**	**15,2**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar**	**6**

							1971;20(2):288-321	
Uruguay	**Paysandú**	**1964**	**3503**	**8,4**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-322**	**6**
Uruguay	**Río Negro**	**1964**	**5570**	**7,4**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-323**	**6**
Uruguay	**Salto**	**1964**	**3718**	**6,7**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-324**	**6**
Uruguay	**San José**	**1964**	**583**	**11,9**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-325**	**6**
Uruguay	**Soriano**	**1964**	**1918**	**4,2**	**1/100**	**General**	**Edwards PQ, Billings EL. Worldwide pattern of skin sensitivity to histoplasmin. Am J Trop Med Hyg. mar 1971;20(2):288-326**	**6**
Venezuela	**Apure**	**1958**	**525**	**8,4**	**1/100**	**General**	**Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52**	**24**
Venezuela	**Aragua**	**1959**	**249**	**39,4**	**1/100**	**General**	**Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis,**	**24**

							realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	
Venezuela	Bolivar	1958	592	89	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Bolivar	1958	627	20,1	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Bolivar	1958	302	6,6	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Bolivar	1958	356	9,3	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Bolivar	1959	77	63,6	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis,	24

							realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	
Venezuela	Carabobo	1959	2859	50,5	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Carabobo	1959	471	18,1	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Lara	1958	583	18,5	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Lara	1958	301	8,6	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Lara	1959	754	18,9	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis,	24

							realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	
Venezuela	Merida	1958	948	11,2	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Sucre	1957	9068	60,1	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Tachira	1958	630	20	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Yaracuy	1959	4164	50	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	24
Venezuela	Yaracuy	1959	1562	69,1	1/100	General	Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis,	24

							realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52	
Venezuela	**Zulia**	**1958**	**760**	**56,1**	**1/100**	**General**	**Principe M., A., Convit, J., and Pifano C., F.,1961. Resultados de las encuestas epidemiologicas sobre histoplasmosis, coccidioidomicosis y tuberculosis, realizadas en algunas regiones de Venezuela. Mycopathol. & Mycol. Appi.,15: 11-52**	**24**

Input dataset

STUDY DATA INPUTS														
	Histoplasmin skin test studies		Histoplamosis prevalence (%)			Number of People living with HIV (year 2012)			Tuberculosis annual incidence in PLHIV			Tuberculosis-related deaths annual incidence in PLHIV		
	# person tested	# person positive	Mean	lower bound of 95%CI	upper bound of 95%CI	N	Low	high	N	Low	high	N	Low	high
argentina	740	280	37,8	34,3	41,3	98000	80000	120000	280	270	630	52	16	110
belize	79	39	49,4	38,4	60,4	3100	2800	3400	29	26	31	3	2	4
bolivia	2767	609	22,0	20,5	23,6	16000	8500	24000	420	390	560	140	100	170
Brazil	11044	2239	20,3	19,5	21,0	595000	530000	660000	14000	13990	14010	2200	1 600	2800
Chile	2874	3	0,1	0,0	0,2	39000	25000	61000	51	48	120	8	4	14
Colombia	8389	2103	25,1	24,1	26,0	150000	110000	190000	1400	1200	1700	310	230	400
Costa Rica	NA	NA	36,9	33,3	39,1	9800	8800	11000	61	55	68	10	8	13
Ecuador	498	113	22,6	19,0	26,3	52000	36000	99000	1200	1100	1400	390	320	460
El Salvador	NA	NA	43,6	33,3	60,6	25000	16000	45000	220	210	220	29	20	39
French Guiana	425	138	32,5	28,0	37,0	2900	1935	3390	22	15	26	1	NA	NA
Guatemala	821	469	57,2	53,8	60,6	58000	36000	130000	900	810	1000	410	340	480
Guyana	49	23	47,0	33,0	61,0	7200	4300	12000	200	200	270	33	21	48
Honduras	74897	29036	38,8	38,4	39,1	26000	21000	33000	460	360	560	110	76	150
Mexico	6060	1384	22,8	21,8	23,9	170000	150000	210000	2500	2500	2600	430	330	540
Nicaragua	NA	NA	36,9	33,3	39,1	9600	6600	15000	110	100	120	17	13	22
Panama	3361	1174	34,9	33,3	36,5	17000	12000	22000	280	250	310	47	35	61
Paraguay	2206	386	17,5	15,9	19,1	13000	7400	24000	280	260	300	57	46	69
Peru	1783	352	19,7	17,9	21,6	76000	36000	230000	2400	2200	2700	450	340	570
Suriname	831	358	43,1	39,7	46,5	4000	3600	4400	59	51	67	15	11	19
Uruguay	23177	2375	10,2	9,9	10,6	13000	9800	19000	130	120	140	20	15	26
Venezuela	24828	11972	48,2	47,6	48,8	110000	74000	160000	1200	1000	1200	330	250	410
Total Latin America	164829	53054	32,2	32,0	32,4	1500000	1200000	1900000	26202	25155	28032	5062	3 777	6405

Output estimates dataset

MODEL OUTPUT ESTIMATES (1)																				
	Histoplamosis prevalence estimates (%)			Number of People living with HIV estimates			Estimates of Histoplasmosis annual incidence in PLHIV						Estimates of Symptomatic Histoplasmosis-HIV incidence (30%scenario) (N[30])			Estimates of Symptomatic Histoplasmosis-HIV incidence (scenario 50%) (N[50])			Estimates of Symptomatic Histoplasmosis-HIV incidence (scenario 70%) (N[70])		
							p100 PLHIV			N											
	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile
Argentina	37,8	35,3	40,3	98502	84984	113188	1,89	1,7	2,1	1864	1546	2232	559	464	670	932	773	1116	1305	1082	1562
Belize	49,4	41,7	57,1	3101	2888	3311	3,04	2,22	4,15	94	68	130	28	21	39	47	34	65	66	48	91
Bolivia	22,0	20,9	23,1	16037	10630	21590	0,88	0,82	0,94	141	93	191	42	28	57	70	47	96	99	65	134
Brazil	20,3	19,7	20,8	594895	549228	640887	0,79	0,77	0,82	4714	4321	5120	1414	1296	1536	2357	2161	2560	3300	3025	3584
Chile	0,1	0,0	0,2	40001	28580	53711	0,00	0,00	0,01	1,22	0,35	2,36	0,37	0,10	0,71	0,61	0,17	1,18	0,85	0,24	1,65
Colombia	25,1	24,4	25,7	150084	121636	178178	1,04	1,01	1,08	1565	1264	1867	469	379	560	782	632	933	1095	885	1307
Costa Rica	36,7	34,5	38,5	9821	9080	10630	1,81	1,64	1,95	177	156	199	53	47	60	89	78	100	124	109	140
Ecuador	22,6	20,0	25,2	55992	39425	81116	0,91	0,78	1,05	508	346	762	153	104	228	254	173	381	356	242	533
El Salvador	44,5	35,9	55,0	26416	18047	37880	2,50	1,75	3,8	660	383	1166	198	115	350	330	191	583	462	268	816
French Guiana	32,5	29,3	35,7	2839	2270	3271	1,50	1,29	1,73	42	32	53	13	10	16	21	16	26	30	23	37
Guatemala	57,2	54,8	59,6	64264	40473	102349	4,16	3,78	4,6	2676	1665	4322	803	500	1297	1338	833	2161	1873	1166	3025
Guyana	47,0	37,1	56,9	7442	5037	10398	2,76	1,84	4,12	204	116	353	61	35	106	102	58	177	143	81	247
Honduras	38,8	38,5	39,0	26255	22337	30761	1,97	1,95	1,99	518	441	607	155	132	182	259	220	304	363	308	425
Mexico	22,8	22,1	23,6	172541	154791	195962	0,92	0,88	0,96	1589	1411	1818	477	423	545	794	706	909	1112	988	1273
Nicaragua	36,7	34,5	38,6	9899	7339	13140	1,81	1,64	1,95	179	130	241	54	39	72	89	65	120	125	91	168
Panama	34,9	33,8	36,0	16985	13466	20536	1,67	1,59	1,75	284	224	346	85	67	104	142	112	173	198	157	242
Paraguay	17,5	16,4	18,6	13700	8747	20148	0,66	0,61	0,71	90	57	134	27	17	40	45	29	67	63	40	94
Peru	19,7	18,4	21,0	90626	43950	169366	0,76	0,7	0,83	693	334	1302	208	100	391	346	167	651	485	234	912
Suriname	43,1	40,7	45,5	4001	3716	4283	2,36	2,14	2,6	94	83	107	28	25	32	47	42	53	66	58	75
Uruguay	10,2	10,0	10,5	13344	10585	16935	0,35	0,35	0,36	47	37	60	14	11	18	24	19	30	33	26	42
Venezuela	48,2	47,8	48,6	111908	83567	144050	2,9	2,85	2,95	3243	2422	4178	973	727	1253	1622	1211	2089	2270	1695	2925
Total Latin America	32,2	32,0	32,4	1512642	1280792	1773148	1,48	1,47	1,49	22367	18934	26225	6710	5680	7867	11183	9467	13112	15657	13254	18357

MODEL OUTPUT ESTIMATES (2)																		
	Estimates of Histoplasmosis-HIV deaths ((N[30])-10% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[50])-10% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[70])-10% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[30])-20% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[50])-20% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[70])-20% case-fatality rate)		
	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile
argentina	56	46	67	93	77	112	130	108	156	112	93	134	186	155	223	261	216	312
belize	3	2	4	5	3	6	7	5	9	6	4	8	9	7	13	13	10	18
bolivia	4	3	6	7	5	10	10	7	13	8	6	11	14	9	19	20	13	27
Brazil	141	130	154	236	216	256	330	302	358	283	259	307	471	432	512	660	605	717
Chile	0,04	0,01	0,07	0,06	0,02	0,12	0,09	0,02	0,17	0,07	0,02	0,14	0,12	0,03	0,24	0,17	0,05	0,33
Colombia	47	38	56	78	63	93	110	89	131	94	76	112	156	126	187	219	177	261
Costa Rica	5	5	6	9	8	10	12	11	14	11	9	12	18	16	20	25	22	28
Ecuador	15	10	23	25	17	38	36	24	53	31	21	46	51	35	76	71	48	107
El Salvador	20	11	35	33	19	58	46	27	82	40	23	70	66	38	117	92	54	163
French Guiana	1	1	2	2	2	3	3	2	4	3	2	3	4	3	5	6	5	7
Guatemala	80	50	130	134	83	216	187	117	303	161	100	259	268	167	432	375	233	605
Guyana	6	3	11	10	6	18	14	8	25	12	7	21	20	12	35	29	16	49
Honduras	16	13	18	26	22	30	36	31	43	31	26	36	52	44	61	73	62	85
Mexico	48	42	55	79	71	91	111	99	127	95	85	109	159	141	182	222	198	255
Nicaragua	5	4	7	9	7	12	13	9	17	11	8	14	18	13	24	25	18	34
Panama	9	7	10	14	11	17	20	16	24	17	13	21	28	22	35	40	31	48
Paraguay	3	2	4	5	3	7	6	4	9	5	3	8	9	6	13	13	8	19
Peru	21	10	39	35	17	65	48	23	91	42	20	78	69	33	130	97	47	182
Suriname	3	3	3	5	4	5	7	6	7	6	5	6	9	8	11	13	12	15
Uruguay	1	1	2	2	2	3	3	3	4	3	2	4	5	4	6	7	5	8
Venezuela	97	73	125	162	121	209	227	170	292	195	145	251	324	242	418	454	339	585
Total Latin America	671	568	787	1118	947	1311	1566	1325	1836	1342	1136	1573	2237	1893	2622	3131	2651	3671

MODEL OUTPUT ESTIMATES (3)																		
	Estimates of Histoplasmosis-HIV deaths ((N[30])-40% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[50])-40% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[70])-40% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[30])-60% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[50])-60% case-fatality rate)			Estimates of Histoplasmosis-HIV deaths ((N[70])-60% case-fatality rate)		
	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile	Median	2.5th percentile	97.5th percentile
argentina	224	186	268	373	309	446	522	433	625	335,46	278,3	401,75	559,11	463,84	669,59	782,75	649,38	937,42
belize	11	8	16	19	14	26	26	19	36	16,95	12,3	23,36	28,25	20,5	38,93	39,55	28,7	54,51
bolivia	17	11	23	28	19	38	39	26	54	25,37	16,74	34,47	42,29	27,91	57,44	59,2	39,07	80,42
Brazil	566	519	614	943	864	1024	1320	1210	1434	848,57	777,83	921,68	1414,29	1296,38	1536,13	1980	1814,94	2150,58
Chile	0,15	0,04	0,28	0,24	0,07	0,47	0,34	0,10	0,66	0,22	0,06	0,43	0,37	0,10	0,71	0,51	0,15	0,99
Colombia	188	152	224	313	253	373	438	354	523	281,64	227,56	336,05	469,4	379,27	560,08	657,16	530,97	784,11
Costa Rica	21	19	24	35	31	40	50	44	56	31,91	28,14	35,87	53,18	46,9	59,79	74,46	65,66	83,71
Ecuador	61	41	91	102	69	152	142	97	213	91,53	62,21	137,09	152,54	103,68	228,48	213,56	145,16	319,88
El Salvador	79	46	140	132	77	233	185	107	327	118,88	68,85	209,89	198,13	114,76	349,82	277,38	160,66	489,74
French Guiana	5	4	6	8	6	11	12	9	15	7,62	5,84	9,49	12,7	9,74	15,81	17,79	13,63	22,13
Guatemala	321	200	519	535	333	864	749	466	1210	481,7	299,78	777,93	802,83	499,63	1296,55	1123,96	699,48	1815,17
Guyana	25	14	42	41	23	71	57	32	99	36,79	20,83	63,55	61,32	34,71	105,92	85,85	48,6	148,29
Honduras	62	53	73	104	88	121	145	123	170	93,27	79,31	109,34	155,45	132,19	182,23	217,63	185,07	255,12
Mexico	191	169	218	318	282	364	445	395	509	285,98	254	327,24	476,63	423,33	545,4	667,29	592,66	763,56
Nicaragua	21	16	29	36	26	48	50	36	67	32,13	23,46	43,32	53,55	39,09	72,19	74,98	54,73	101,07
Panama	34	27	41	57	45	69	79	63	97	51,04	40,28	62,23	85,06	67,13	103,72	119,09	93,99	145,21
Paraguay	11	7	16	18	11	27	25	16	38	16,29	10,31	24,14	27,15	17,19	40,24	38	24,07	56,33
Peru	83	40	156	139	67	260	194	94	365	124,68	60,14	234,4	207,8	100,23	390,66	290,92	140,32	546,93
Suriname	11	10	13	19	17	21	26	23	30	16,97	14,98	19,19	28,29	24,97	31,99	39,61	34,96	44,79
Uruguay	6	5	7	9	7	12	13	10	17	8,51	6,74	10,83	14,19	11,24	18,05	19,86	15,73	25,27
Venezuela	389	291	501	649	484	836	908	678	1170	583,81	435,94	752,07	973,01	726,56	1253,46	1362,22	1017,19	1754,84
Total Latin America	2684	2272	3147	4473	3787	5245	6263	5302	7343	4026,02	3408,21	4720,46	6710,03	5680,35	7867,43	9394,04	7952,48	11014,4

Model SAS code

```
libname library '.';

/**********************/
/**** MACROS *****/
/**********************/

%MACRO PERT_GLOBAL(pays,nbech,init1,modeprev,minprev,maxprev,init2,modehivinc,minhivinc,maxhivinc);

dm log 'clear';

/*
%PERT(&nbech,&init1,&modeprev, &minprev,&maxprev, 4,prevalence,histoprev);
%PERT(&nbech,&init2,&modehivinc, &minhivinc,&maxhivinc,4,hivincid,hivincidnum);

/* Calculation of incidence */
data pert_final_&pays;
 merge pert_prevalence pert_hivincid;

 PERT_histoincid=(PERT_histoprev/100)/(0.321*(1-(PERT_histoprev/100)));
 PERT_histoincidnum=PERT_histoincid*PERT_hivincidnum/100;

 PERT_histoincidnum_30=PERT_histoincidnum*0.3;          PERT_histoincidnum_50=PERT_histoincidnum*0.5;
PERT_histoincidnum_70=PERT_histoincidnum*0.7;

PERT_histoincidnum_30_l10=PERT_histoincidnum_30*0.1;PERT_histoincidnum_50_l10=PERT_histoincidnum_50*0.1;PERT_histoincidnum_70_l10=PERT_his
toincidnum_70*0.1;

PERT_histoincidnum_30_l20=PERT_histoincidnum_30*0.2;PERT_histoincidnum_50_l20=PERT_histoincidnum_50*0.2;PERT_histoincidnum_70_l20=PERT_his
toincidnum_70*0.2;
```

```
PERT_histoincidnum_30_l40=PERT_histoincidnum_30*0.4;PERT_histoincidnum_50_l40=PERT_histoincidnum_50*0.4;PERT_histoincidnum_70_l40=PERT_his
toincidnum_70*0.4;

PERT_histoincidnum_30_l60=PERT_histoincidnum_30*0.6;PERT_histoincidnum_50_l60=PERT_histoincidnum_50*0.6;PERT_histoincidnum_70_l60=PERT_his
toincidnum_70*0.6;


run;

/*Calculate median and percentiles (2.5%/97.5%) from the output distribution of each parameter*/
%PERT_STAT(final_&pays,histoincid);
%PERT_STAT(final_&pays,histoincidnum);
%PERT_STAT(final_&pays,histoincidnum_30);     %PERT_STAT(final_&pays,histoincidnum_50);     %PERT_STAT(final_&pays,histoincidnum_70);
%PERT_STAT(final_&pays,histoincidnum_30_l10);%PERT_STAT(final_&pays,histoincidnum_50_l10);%PERT_STAT(final_&pays,histoincidnum_70_l10);
%PERT_STAT(final_&pays,histoincidnum_30_l20);%PERT_STAT(final_&pays,histoincidnum_50_l20);%PERT_STAT(final_&pays,histoincidnum_70_l20);
%PERT_STAT(final_&pays,histoincidnum_30_l40);%PERT_STAT(final_&pays,histoincidnum_50_l40);%PERT_STAT(final_&pays,histoincidnum_70_l40);
%PERT_STAT(final_&pays,histoincidnum_30_l60);%PERT_STAT(final_&pays,histoincidnum_50_l60);%PERT_STAT(final_&pays,histoincidnum_70_l60);

data library.pert_final_stat_&pays;
length country $30.;

merge PERT_histoprev_stat PERT_hivincidnum_stat PERT_histoincid_stat PERT_histoincidnum_stat
 PERT_histoincidnum_30_stat       PERT_histoincidnum_50_stat       PERT_histoincidnum_70_stat
 PERT_histoincidnum_30_l10_stat  PERT_histoincidnum_50_l10_stat  PERT_histoincidnum_70_l10_stat
 PERT_histoincidnum_30_l20_stat  PERT_histoincidnum_50_l20_stat  PERT_histoincidnum_70_l20_stat
 PERT_histoincidnum_30_l40_stat  PERT_histoincidnum_50_l40_stat  PERT_histoincidnum_70_l40_stat
 PERT_histoincidnum_30_l60_stat  PERT_histoincidnum_50_l60_stat  PERT_histoincidnum_70_l60_stat
;
country="&pays";
run;

options orientation=landscape;
```

```
ods rtf body="&pays..rtf" style=minimal;
title "&pays";
proc print data=library.pert_final_stat_&pays noobs;
 var PERT_histoprev:;
 format PERT_histoprev: 5.2;
run;
proc print data=library.pert_final_stat_&pays noobs;
 var PERT_hivincidnum:;
run;
proc print data=library.pert_final_stat_&pays noobs;
 var PERT_histoincid_median PERT_histoincid_p2_5 PERT_histoincid_p97_5 PERT_histoincidnum_median PERT_histoincidnum_p2_5
PERT_histoincidnum_p97_5;
 format PERT_histoincid_median PERT_histoincid_p2_5 PERT_histoincid_p97_5 PERT_histoincidnum_median PERT_histoincidnum_p2_5
PERT_histoincidnum_p97_5 5.2;
run;
%LISTING(30,_&pays);
%LISTING(50,_&pays);
%LISTING(70,_&pays);

ods rtf close;

%MEND PERT_GLOBAL;

%MACRO PERT(n,init,val_mode,val_min, val_max,lambda,tableout,var);

data param;

 range =&val_max - &val_min;

 mu=%sysevalf((&val_min + &val_max + &lambda * &val_mode ) / ( &lambda + 2 ));

 if mu=%sysevalf(&val_mode) then v=(&lambda/2)+1;
 else v=(( mu - &val_min ) * ( 2 * &val_mode - &val_min - &val_max )) / (( &val_mode - mu ) * ( &val_max - &val_min ));
```

```
 w = ( v * ( &val_max - mu )) / ( mu - &val_min );

 call symput('mu',mu);
 call symput('v',v);
 call symput('w',w);
 call symput('range',range);

run;
%put &mu &v &w;

data pert_&tableout;
call streaminit(&init);
%do i=1 %to &n;
 PERT_&var=RAND('BETA', &v, &w)*&range + &val_min; output;
%end;
run;

%PERT_STAT(&tableout,&var);

%MEND PERT;

%MACRO PERT_STAT(table,var);
proc univariate data=pert_&table;var PERT_&var;output out=pert_&var._stat n=nb_echantillons median=PERT_&var._median pctlpts=2.5 97.5
pctlpre=PERT_&var._p;run;
data pert_&var._stat;
 set pert_&var._stat;
 PERT_&var._median=round(PERT_&var._median,0.00001);
 PERT_&var._p2_5=round(PERT_&var._p2_5,0.00001);
 PERT_&var._p97_5=round(PERT_&var._p97_5,0.00001);
%MEND PERT_STAT;
```

```
%MACRO LISTING(num1,table);
proc print data=library.pert_final_stat&table noobs;
 var PERT_histoincidnum_&num1._median PERT_histoincidnum_&num1._p2_5 PERT_histoincidnum_&num1._p97_5;
 format PERT_histoincidnum_&num1._median PERT_histoincidnum_&num1._p2_5 PERT_histoincidnum_&num1._p97_5 5.2;
run;
ods rtf startpage=no;
proc print data=library.pert_final_stat&table noobs;
 var PERT_histoincidnum_&num1._l10_median PERT_histoincidnum_&num1._l10_p2_5 PERT_histoincidnum_&num1._l10_p97_5;
 format PERT_histoincidnum_&num1._l10_median PERT_histoincidnum_&num1._l10_p2_5 PERT_histoincidnum_&num1._l10_p97_5 5.2;
run;
proc print data=library.pert_final_stat&table noobs;
 var PERT_histoincidnum_&num1._l20_median PERT_histoincidnum_&num1._l20_p2_5 PERT_histoincidnum_&num1._l20_p97_5;
 format PERT_histoincidnum_&num1._l20_median PERT_histoincidnum_&num1._l20_p2_5 PERT_histoincidnum_&num1._l20_p97_5 5.2;
run;
proc print data=library.pert_final_stat&table noobs;
 var PERT_histoincidnum_&num1._l40_median PERT_histoincidnum_&num1._l40_p2_5 PERT_histoincidnum_&num1._l40_p97_5;
 format PERT_histoincidnum_&num1._l40_median PERT_histoincidnum_&num1._l40_p2_5 PERT_histoincidnum_&num1._l40_p97_5 5.2;
run;
proc print data=library.pert_final_stat&table noobs;
 var PERT_histoincidnum_&num1._l60_median PERT_histoincidnum_&num1._l60_p2_5 PERT_histoincidnum_&num1._l60_p97_5;
 format PERT_histoincidnum_&num1._l60_median PERT_histoincidnum_&num1._l60_p2_5 PERT_histoincidnum_&num1._l60_p97_5 5.2;
run;
ods rtf startpage=yes;
%MEND LISTING;


/**********************/
/**** ANALYSIS ****/
/**********************/

%PERT_GLOBAL(argentina,100000,123,37.8,34.3,41.3,456,98000,80000,120000);

%PERT_GLOBAL(belize,100000,132,49.4,38.4,60.4,465,3100,2800,3400);
```

```
%PERT_GLOBAL(bolivia,100000,213,22,20.5,23.6,546,16000,8500,24000);

%PERT_GLOBAL(Brazil,100000,231,20.3,19.5,21.0,564,595000,530000,660000);

%PERT_GLOBAL(Chile,100000,312,0.1,0.000001,0.2,645,39000,25000,61000);
proc univariate data=pert_final_chile;var PERT_histoincid;output out=pert_histoincid_stat n=nb_echantillons median=PERT_histoincid_median pctlpts=2.5
97.5 pctlpre=PERT_histoincid_p;run;
proc print noobs;run ;

%PERT_GLOBAL(Colombia,100000,321,25.1,24.1,26.0,654,150000,110000,190000);

%PERT_GLOBAL(Costa_Rica,100000,234,36.9,33.3,39.1,789,9800,8800,11000); /*for Costa-Rica, prev=mean prev(Honduras,Panama), iclow=min(iclow
honduras,iclow Panama),ichigh=max(ichigh honduras,ichigh Panama)*/

%PERT_GLOBAL(Ecuador,100000,243,22.6,19.0,26.3,798,52000,36000,99000);

%PERT_GLOBAL(El_Salvador,100000,324,43.6,33.3,60.6,879,25000,16000,45000);/*Same method as for Costa-Rica for prev, taking into account Honduras,
Panama and Guatemala*/

%PERT_GLOBAL(French_Guiana,100000,342,32.5,28.0,37.0,897,2900,1935,3390);
%PERT(100000,99,0.77,0.45,1.09,4,tbincid,tbincid);
%PERT(100000,98,2900,1935,3390,4,hivnum,hivnum);
data pert_final_guyane2;
 merge pert_tbincid pert_hivnum;
 PERT_tbincidnum=PERT_tbincid*PERT_hivnum/100;
 run;
%PERT_STAT(final_guyane2,tbincidnum);/* result:  22 [14-30]*/



%PERT_GLOBAL(Guatemala,100000,423,57.2,53.8,60.6,978,58000,36000,130000);
```

```
%PERT_GLOBAL(Guyana,100000,432,47.0,33.0,61.0,987,7200,4300,12000);

%PERT_GLOBAL(Honduras,100000,111,38.8,38.4,39.1,222,26000,21000,33000);

%PERT_GLOBAL(Mexico,100000,333,22.8,21.8,

%PERT_GLOBAL(Nicaragua,100000,555,36.9,33.3,39.1,666,9600,6600,15000);/*Idem Costa-Rica for prev*/

%PERT_GLOBAL(Panama,100000,777,34.9,33.3,36.5,888,17000,12000,22000);

%PERT_GLOBAL(Paragway,100000,778,17.5,15.9,19.1,889,13000,7400,24000);

%PERT_GLOBAL(Peru,100000,779,19.7,17.9,21.6,887,76000,36000,230000);

%PERT_GLOBAL(Suriname,100000,789,43.1,39.7,46.5,998,4000,3600,4400);

%PERT_GLOBAL(Uruguay,100000,667,10.2,9.9,10.6,553,13000,9800,19000);

%PERT_GLOBAL(Venezuela,100000,442,48.2,47.6,48.8,336,110000,74000,160000);

%PERT_GLOBAL(total,100000,999,32.19,31.96,32.41,991,1500000,1200000,1900000);

data library.PERT_final_global;
 set library.PERT_final_stat:;
 drop nb_echantillons;
run;

proc print noobs;run;
```