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Estimation of the serious mycoses burden in Indonesia

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Background: Indonesia is a tropical country, warm and humid, with numerous environmental fungi. Knowing the fungal burden in the country helps policy makers and clinicians. The Indonesian population was ~260.6 million in 2015. We have estimated the burden of serious fungal diseases in the country.

Material/methods: We found all published and unpublished data and estimated the incidence and prevalence of fungal diseases based on the populations at risk. HIV data were derived from UNAIDS (2015) report and % of untreated patients with CD4 <350 estimated from the 2012 UNAIDS data (120,000). Pulmonary TB data was from 2014, and assumes a 10% mortality (274,400). We derived COPD data from Tan et al (2009) and Lim et al (2015) (225,000 admissions among 4.8M). Lung cancer incidence was from Globocan (34,700). Asthma prevalence in adults (6.9%) was from Sundaru et al (2005).

Results: The prevalence of cryptococcosis in ambulatory HIV-infected patients was 6.4% in Jakarta and 7.1% in Bandung. Among 55 AIDS patients with pneumonia PCP was found in 14.5%. Most PCP diagnoses are made in non-HIV patients. We have estimated 1% of new AIDS patients have disseminated histoplasmosis and 1% *T. marneffeii* infection, in the absence of population data, but some diagnosed cases. Using a low international figure of 5/100,000 the incidence of candidemia is 13,029 and invasive candidiasis 32,570 cases

annually. The WHO estimated that in Indonesia, 274,397 TB patients survived 1 year post-treatment and we estimate that 17,561 developed chronic pulmonary aspergillosis (CPA), a 5 year point prevalence of ~55,354 patients, a total estimate of CPA of ~83,000 patients. The incidence of invasive pulmonary aspergillosis (IA) in critically ill patients Jakarta is 7.65%, and we estimate a total of 1,563 IA in leukameia and transplant recipients and 13,900 cases in COPD and critically ill patients. Recurrent vulvovaginal candidiasis is estimated to affect 6% of woment between 15 and 50 years, a total of about 4 million in any year. Cases of fungal keratits, tinea capitis, disseminated histoplasmosis and *T. marneffe*i infections are made, but incidence estimates are lacking.

Conclusions: Over 5.3 million Indonesians probably have a fungal infection in any given year (2.05%). The estimates are almost certainly significant underestimates. Indonesia has a high burden of fungal infections, partly attributable to high TB incidence, moderate numbers of untreated HIV patients, and many other risk factors. Addition efforts to improve diagnostic capability and undertake epidemiology studies are required.

Infection	Number of infections per underlying disorder per year					Rate/100K	Total burden
	None	HIV/AIDS	Respiratory	Cancer/Tx	ICU		
Oesophageal candidiasis	-	38,500	-	-	-	14.8	38,500
<u>Candidaemia</u>	-	-	-	9,120	3,909	5.0	13,029
Candida peritonitis	-	-	-	-	1,954	0.75	342
Recurrent vaginal candidiasis (4x/year +)	4,368,155	-	-	-	-	3,352	4,368,155
ABPA	-	-	328,137	-	-	126	328,137
SAFS	-	-	433,140	-	-	166	433,140
Chronic pulmonary aspergillosis	-	-	83,030	-	-	32	83,030
Invasive aspergillosis	-	-	902	1,563	13,903	6.3	16,368
<u>Mucormycosis</u>	-	-	-	480	-	0.2	480
Cryptococcal meningitis	-	2,100	-	-	-	0.81	2,100
Pneumocystis pneumonia	-	4,350	?	-	-	1.7	4,350
Histoplasmosis	?	300	?	?	?	0.12	300
<u>Talaromyces marneffe</u> i infection	?	300	-	-	-	0.12	300
Fungal keratitis	?	-	-	-	-	?	?
<u>Tinea capitis</u>	?	-	-	-	-	?	?
Total burden estimated	4,368,155	99,550	845,209	11,164	19,766		5,343,844