

RE-ESTIMATION OF SERIOUS MYCOSES BURDEN IN INDONESIA

R. Wahyuningih^{1,2}, J. Prihartono¹, R. Syam¹, R. Adawiyah¹, EAT. Wulandari¹, A. Rosaliyani¹, D. Imran¹, Mulyati¹, FE. Siagian¹, D. Denning³

¹Department of Parasitology, Universitas Indonesia, Faculty of Medicine, Jakarta, ²Department of Community Medicine Universitas Indonesia, Faculty of Medicine, Jakarta, ³Department of Dentistry, Dr. Cipto Mangunkusumo Hospital, Jakarta, ⁴Department of Neurology, Universitas Indonesia, Faculty of Medicine/Dr. Cipto Mangunkusumo Hospital, Jakarta, ⁵Department of Parasitology, Universitas Kristen Indonesia, School of Medicine, Jakarta, ⁶National Aspergillosis Center, University Hospital of South Manchester, Southmoor Road, Manchester, England, in association with the LIFE program at www.LIFE-worldwide.org



Introduction & purpose:

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.

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We found all published and unpublished data and estimated the incidence and prevalence of fungal diseases based on the populations at risk.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

Country profile

Indonesia is country with huge population which distributed in >17 000 islands. Mostly people live in Java and Sumatera, in the big cities, where complete medical facilities Available.



Results

The prevalence of cryptococcosis in ambulatory HIV-infected patients was 6.4% in Jakarta and 7.1% in Bandung, while among HIV patients with meningitis was 21%. We also diagnosed cryptococcosis among non HIV patient as meningitis, pulmonary cryptococcosis, skin infection and cryptococcalemia. Among 55 AIDS patients with pneumoconiosis PCP was found in 14.5%. Most PCP diagnoses are made in non-HIV patients; e.g. ICU admitted patient with different underlying diseases. We have estimated 3% of new AIDS patients have disseminated histoplasmosis and 1% *T. marneffei* 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 prevalence of candidemia in adult & children during the last 5 years is 12% (data Dept. Parasitology-FKUI). 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 Indonesia and transplant recipients and 13,900 cases in COPD and critically ill patients. Recurrent vulvovaginal candidiasis is estimated to affect 6% of women between 15 and 50 years, a total of about 4 million in any year. Cases of fungal keratitis, tinea capitis, disseminated histoplasmosis, and *T. marneffei* infections are made, but incidence estimates are lacking.

Infections	Number of infections per million per quarter per year				Rate / 100k	Total burden
	Year	Prevalence	Incidence	CFR		
Disseminated histoplasmosis	2015	60,000	-	0.00	5,000	100
Disseminated cryptococcosis	2015	100,000	-	0.00	5,000	100
Disseminated candidiasis	2015	32,570	-	0.00	1,300	26
Invasive candidiasis	2015	13,029	-	0.00	500	10
Chronic pulmonary aspergillosis	2015	83,000	-	0.00	3,300	66
Invasive pulmonary aspergillosis	2015	1,563	-	0.00	60	1
Chronic vulvovaginal candidiasis	2015	4,000,000	-	0.00	160,000	3,200
Chronic otitis media with effusion	2015	1,000,000	-	0.00	40,000	800
Chronic sinusitis	2015	1,000,000	-	0.00	40,000	800
Chronic rhinosinusitis	2015	1,000,000	-	0.00	40,000	800
Chronic bronchitis	2015	1,000,000	-	0.00	40,000	800
Chronic obstructive pulmonary disease	2015	1,000,000	-	0.00	40,000	800
Chronic kidney disease	2015	1,000,000	-	0.00	40,000	800
Chronic liver disease	2015	1,000,000	-	0.00	40,000	800
Chronic heart disease	2015	1,000,000	-	0.00	40,000	800
Chronic lung disease	2015	1,000,000	-	0.00	40,000	800
Chronic neurological disease	2015	1,000,000	-	0.00	40,000	800
Chronic mental health disease	2015	1,000,000	-	0.00	40,000	800
Chronic autoimmune disease	2015	1,000,000	-	0.00	40,000	800
Chronic endocrine disease	2015	1,000,000	-	0.00	40,000	800
Chronic musculoskeletal disease	2015	1,000,000	-	0.00	40,000	800
Chronic sensory organ disease	2015	1,000,000	-	0.00	40,000	800
Chronic skin disease	2015	1,000,000	-	0.00	40,000	800
Chronic blood and immune system disease	2015	1,000,000	-	0.00	40,000	800
Chronic cancer	2015	1,000,000	-	0.00	40,000	800
Chronic congenital anomalies	2015	1,000,000	-	0.00	40,000	800
Chronic infectious disease	2015	1,000,000	-	0.00	40,000	800
Chronic parasitic disease	2015	1,000,000	-	0.00	40,000	800
Chronic zoonotic disease	2015	1,000,000	-	0.00	40,000	800
Chronic environmental disease	2015	1,000,000	-	0.00	40,000	800
Chronic occupational disease	2015	1,000,000	-	0.00	40,000	800
Chronic drug-induced disease	2015	1,000,000	-	0.00	40,000	800
Chronic toxic disease	2015	1,000,000	-	0.00	40,000	800
Chronic radiation-induced disease	2015	1,000,000	-	0.00	40,000	800
Chronic genetic disease	2015	1,000,000	-	0.00	40,000	800
Chronic metabolic disease	2015	1,000,000	-	0.00	40,000	800
Chronic nutritional disease	2015	1,000,000	-	0.00	40,000	800
Chronic developmental disease	2015	1,000,000	-	0.00	40,000	800
Chronic degenerative disease	2015	1,000,000	-	0.00	40,000	800
Chronic age-related disease	2015	1,000,000	-	0.00	40,000	800
Chronic idiopathic disease	2015	1,000,000	-	0.00	40,000	800
Chronic unknown disease	2015	1,000,000	-	0.00	40,000	800

Discussion

Due to limited facilities of mycology laboratory, until recently most of mycotic diseases has only been reported sporadically. A detailed study on epidemiology is limited, so magnitude of the problem is not clear.

- Aspergillosis:**
 - Chronic aspergillosis:** Indonesia is rank second on the number of TB which is an important factor related with chronic aspergillosis. We estimated ca. 83,000 treated pulmonary TB patient will suffered CA. Due to the similarity of clinical signs, usually they were treated as recurrent TB.
 - Invasive aspergillosis:** we estimated the total burden is 13,566 from the total population. A multicenter study on the 6 ICU in Jakarta showed the prevalence of probable IA is 7.6%, which is not describes the real situation.
- Candidemia:** Candidemia is hospital related infection. Our data limited on the data from hospital in Jakarta which is lower from our estimation.
- Cryptococcosis:** With the arrival of AIDS pandemic we saw an increase of cryptococcal meningitis among AIDS population. Patients diagnosed is limited to Jakarta & Bandung, and in a small number from other cities such as Denpasar Bali, Manado & Jayapura. We also diagnosed cryptococcosis in non HIV patients, it indicates that the problem of cryptococcosis is bigger than what has been reported.
- Histoplasmosis:** There are two important types of histoplasmosis i.e. acute disseminated and chronic form. Disseminated histoplasmosis has started to be reported since 1992 and since 2004 we identified histoplasmosis among AIDS patients with skin dissemination. But, we did not have any data on the chronic form which have clinical symptoms similar to pulmonary TB. We suspect that among patient diagnosed as pulmonary TB some of them are people with histoplasmosis.
- PCP:** PCP known as severe infection among patient with AIDS, but since prophylaxis were given to all newly diagnosed patient, it was difficult to get an actual incidence. We also diagnosed PCP among non HIV patient admitted to the ICU.
- Other mycotic infection:** such as vaginitis, dermatophytoses even though important, but are not serious, life threatening infection.

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 serious fungal infections, partly attributable to high TB incidence, moderate numbers of HIV patients, and many other risk factors. Additional efforts to improve diagnostic capability and undertake epidemiology studies are required.

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