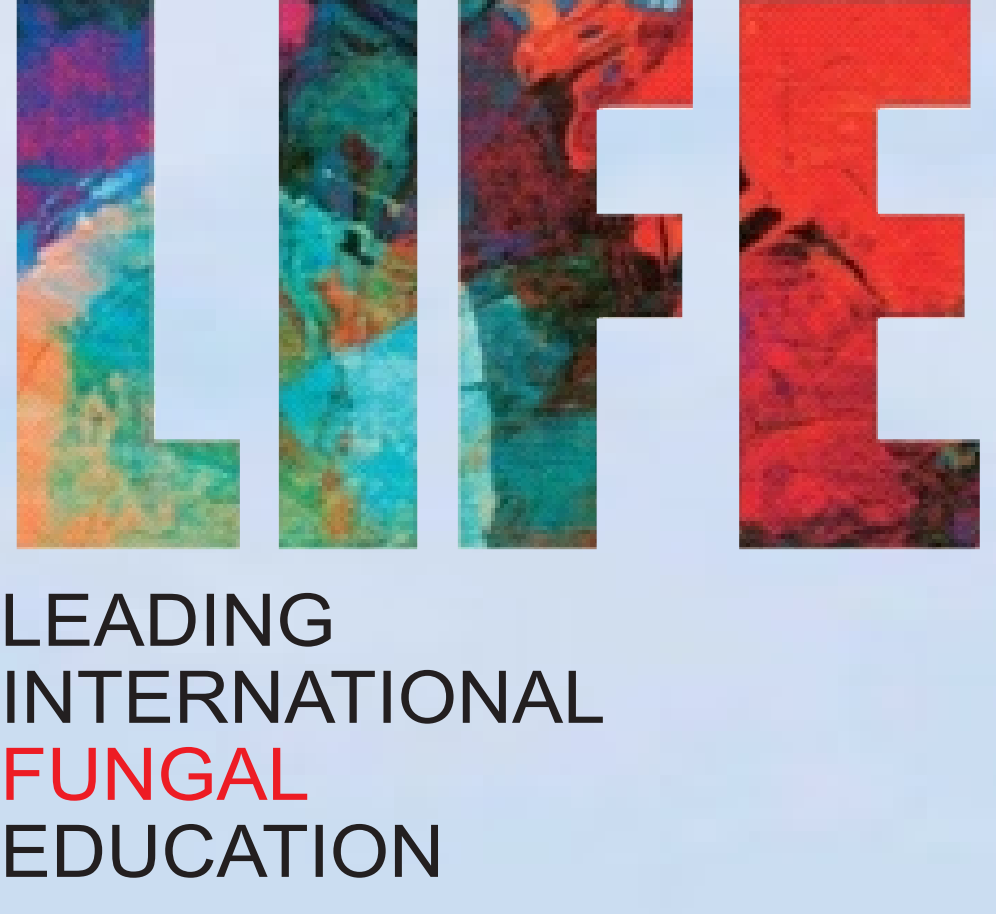


# RE-ESTIMATION OF SERIOUS MYCOSES BURDEN IN INDONESIA



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- We found all published and unpublished data and estimated the incidence and prevalence of fungal diseases based on the populations at risk.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

## Map of Indonesia



## 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 cryptococcemia. Among 55 AIDS patients with pneumonia 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 1% 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 leukemia 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 keratitis, tinea capitis, disseminated histoplasmosis and *T. marneffei* infections are made, but incidence estimates are lacking.

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
Candidaemia	–	–	–	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	–	–	–	1,563	13,903	5.9	15,466
Mucormycosis	–	–	–	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
Talaromyces marneffei infection	?	300	–	–	–	0.12	300
Fungal keratitis	–	–	–	–	–	–	–
Tinea capitis	?	–	–	–	–	?	?
Total burden estimated	893,579	19,980	82,173	1,987	1,367	–	999,086

## 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. 83,030 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 15,466 from the total population. A multicenter study on the 6 ICU in Jakarta showed the prevalence of probabble IA is 7,6% which is not describes the real situation.
- Candidemia:** Candidemia is hospital related infection. Our data limited on the data from hospitals in Jakarta which is lower from our estimation.
- Cryptococcus:** 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 1932 and since 2004 we identified histoplasmosis among AIDS patients with skin dissemination. But we do 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. Addition efforts to improve diagnostic capability and undertake epidemiology studies are required.

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