

The burden of serious fungal diseases in Madagascar

Rivo Andry Rakotoarivelo,¹ Voahangy Rasolofo Razanamparany,² Jocelyn Rakotomizao³ and David W. Denning⁴

1. Department of Infectious Diseases, University Hospital Center of Fianarantsoa, Madagascar.

2. Mycobacteria Unit, Institut Pasteur de Madagascar, Antananarivo, Madagascar

3. Department of Respiratory Diseases, Joseph Raseta Hospital, Antananarivo, Madagascar

4. The University of Manchester and The National Aspergillosis Centre in association with the LIFE program at www.LIFE-Worldwide.org.

Email - vrasolof@pasteur.mg

Introduction In Africa, few data on the burden of fungal disease are published, but Madagascar is an exception. Madagascar is an island country with a diverse and unique ecosystem, a population of ~20 million and a GDP of \$449 per person in 2014, making it one of the poorest countries in the world. It has a high HIV burden and a modest sized TB burden. There has been a strong tradition of medical mycology in Madagascar, with publications as far back as 1962¹. We have estimated the burden of serious fungal infections in Madagascar.

Methods We searched for existing data and estimated the incidence and prevalence of fungal diseases based on the populations at risk and available epidemiological data. Data were derived from the World Health Organization (WHO), The Joint United Nations Programme on HIV/AIDS (UNAIDS) and national and regional published reports. When no data existed, risk populations were used to estimate frequencies of fungal infections, using previously described methodology by LIFE.

In Madagascar, there are an estimated 59,000 HIV infected people, 27,445 TB cases of whom an estimated 19,120 patients with pulmonary TB survive and an estimated 522,400 adults asthmatics (4.67% of the population).

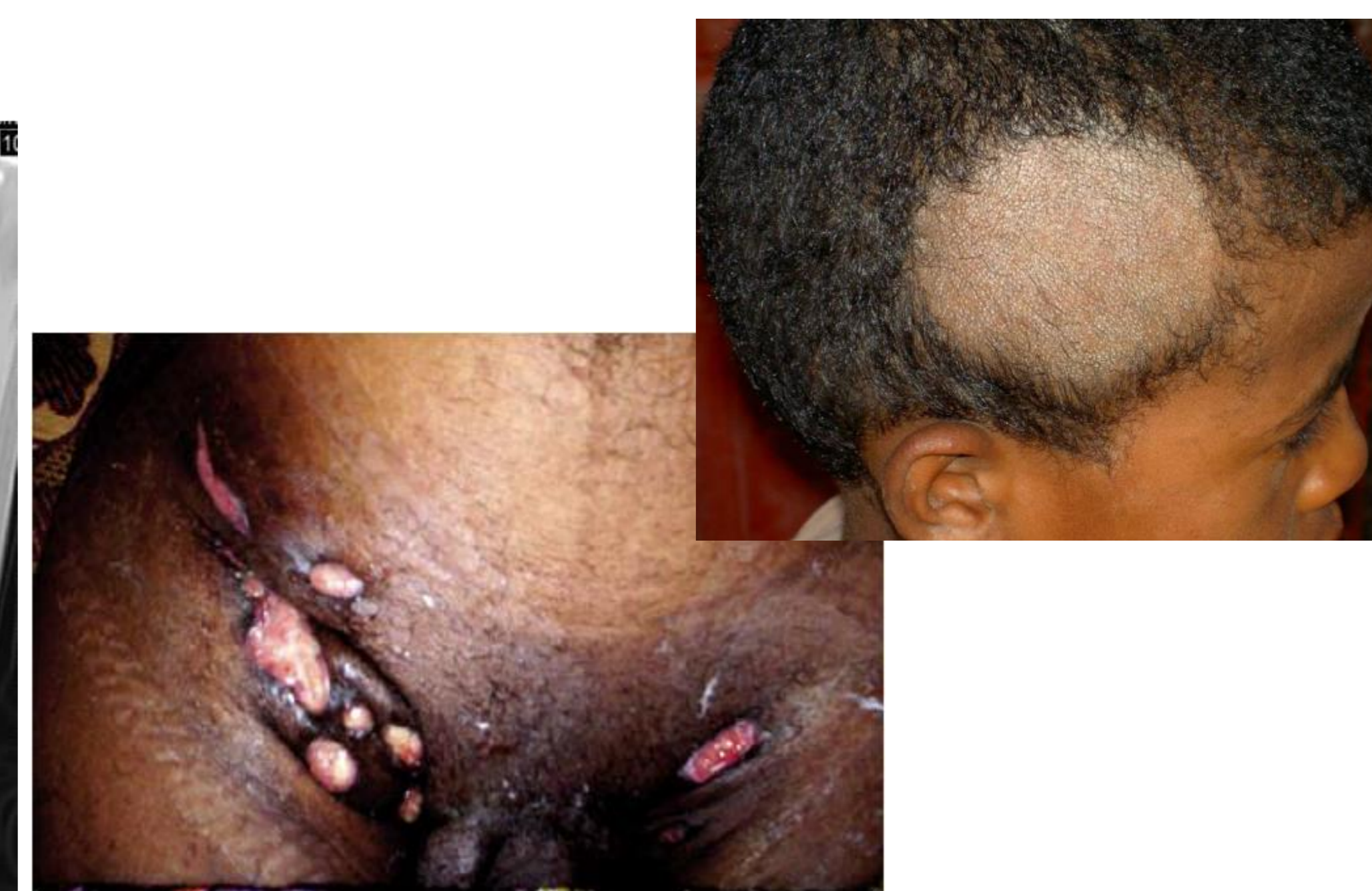
Results In Madagascar 43% of the population are children, and 5% are women >60 years old. Recurrent vulvovaginal candidiasis (>4 episodes/year) is estimated to occur in 2,703/100,000 females. Oesophageal candidiasis is estimated to affect 6,700 HIV patients, given the ~25,000 with <350 CD4 cells not on ART. An estimated 875 and 1,250 patients develop cryptococcosis and PCP each year, with an overall HIV mortality of 3,900 people. An estimated 2,625 have chronic pulmonary aspergillosis after pulmonary tuberculosis - 67% of the total burden. ABPA and SAFS were estimated in 66.6/100,000 and 87.8/100,000 respectively.

A population estimate of chromoblastomycosis was completed in 1996 and a rate of 14/100,000 was found (2,745 cases)². Tinea capitis is estimated to affect a minimum of 10% of children, over 840,000 cases.

Table 1. Burden of serious fungal infections in Madagascar

Infection	Number of infections per underlying disorder per year					Total burden	Rate /100K
	None	HIV/AIDS	Respiratory	Cancer /Tx	ICU		
Oesophageal candidiasis	-	6,700	-	-	-	4,150	34.1
Candidaemia	-	-	-	687	294	981	5
Recurrent vaginal candidiasis (4x/year +)	265,248	-	-	-	-	265,248	2,703*
ABPA	-	-	13,060	-	-	13,060	66.7
SAFS	-	-	17,239	-	-	17,239	87.8
Chronic pulmonary aspergillosis	-	-	3,975	-	-	3,978	90
Invasive aspergillosis	-	-	??	118	?	297	
Mucormycosis	?	?	?	39	?	39	0.2
Cryptococcal meningitis	-	875	-	-	-	875	4.5
Pneumocystis pneumonia	-	938	-	-	-	938	4.8
Histoplasmosis	-	??	?	-	-	?	-
Fungal keratitis	?	-	-	-	-	?	
Chromoblastomycosis	2,309	-	-	-	-	2,309	11.8
Tinea capitis	843,875	-	-	-	-	843,875	4,300
Total burden						1,178,319	

* rate for adult females only

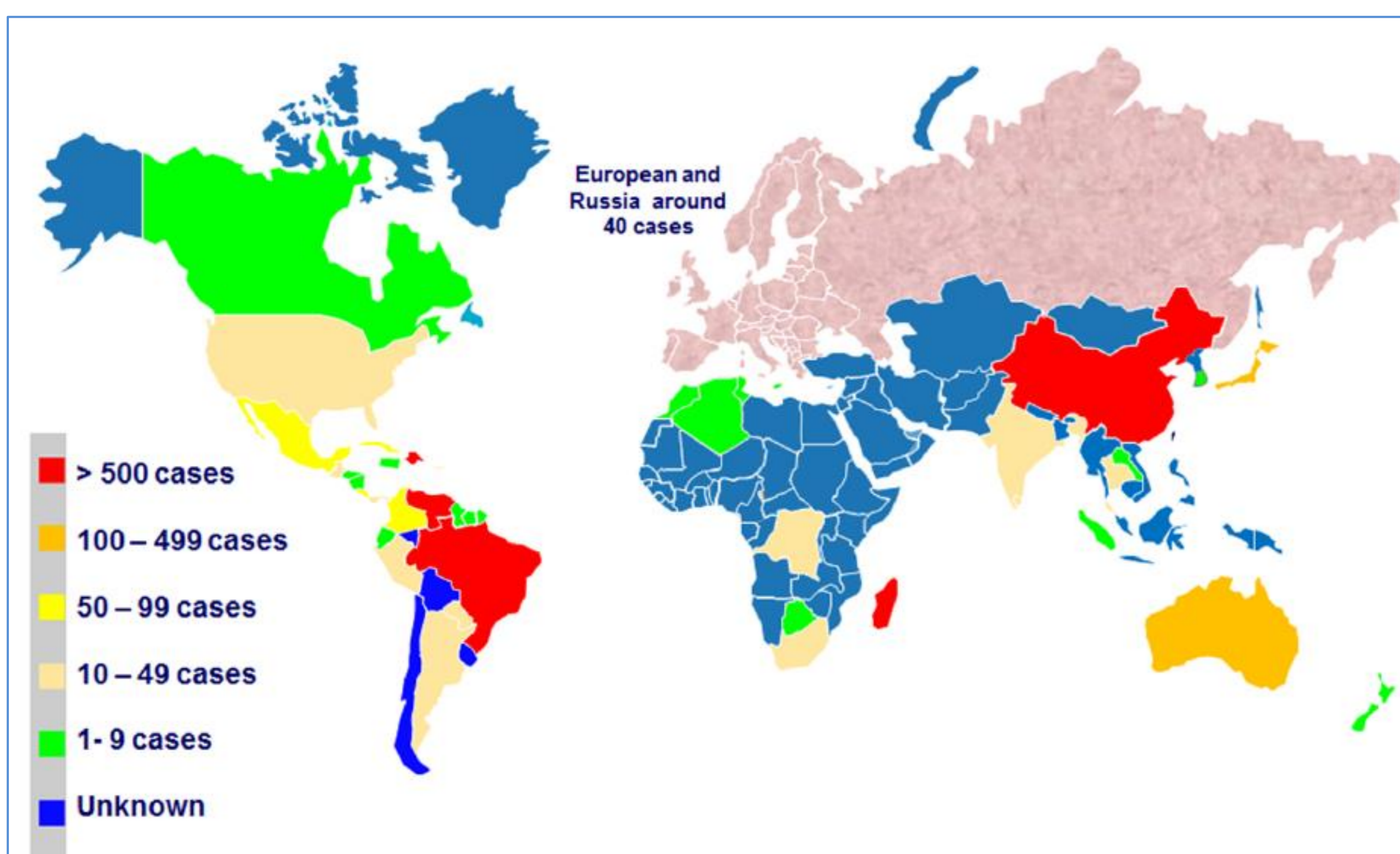


Aspergilloma and CPA, african histoplasmosis and tinea capitis cases from Madagascar³⁻⁵

Conclusion The present study indicates that around to 6% (1,155,796) of the population is affected by a serious fungal infection, predominantly recurrent VVC in women and tinea capitis in children. Further epidemiological studies are needed to validate and extend these estimates.

References

- Brygoo ER, Revue critique des recherches mycologiques a Madagascar et bibliographie pour les annees 1946-1960. Mycopathologica 1962; vv:363-72.
- Esterre P, Andriantsimahavandy A, Ramarcel ER, Pecarriere JL. Forty years of chromoblastomycosis in Madagascar: a review. Am J Trop Med Hyg 1996; 55: 45-47.
- Rakotoson JL et al. Un cas rare d'aspergillome volumineux développé au sein d'une lésion de fibrose pulmonaire secondaire à une sclérodermie systémique chez une malade immunocompétente à Madagascar. Bull Soc Pathol Exot 2011;104:325-328.
- Rakotoarivelo RA et al. Une histoplasmosse africaine chez un patient malgache immunocompétent. Bull Soc Pathol Exot 2010;103:19-21.
- Carod J-F et al, Outbreak of Tinea capitis and corporis in a primary school in Antananarivo, Madagascar. J Infect Dev Ctries 2011;5:732-36.



The number of reported cases of chromoblastomycosis in different countries (from www.gaffi.org/wp-content/uploads/chromoblastomycosis-briefing-document-Nov-2014.pdf)