



How common is life-threatening fungal disease and sepsis?

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Deaths from fungal infections

Fungal Infection	TB (2018)	Malaria (2017)
>1,660,000	1,450,000 (251,000 with HIV) ↓	435,000 ↓↓



Fungal infections in hospitalised and critically ill patients - 2015

Fungal infection	Annual burden	Case fatality rate if treated	Estimated deaths
Invasive candidiasis	>750,000	~45% mortality in HIC	>350,000
Invasive aspergillosis	>250,000	~50% mortality in HIC	>125,000
<i>Pneumocystis pneumonia</i>	>100,000	~50% non-AIDS, in HIC	>50,000
Total	>1.1 million		>425,000

Rate of candidaemia by country

Country (Reference)	Burden	Rate/100,000	Comments
Brazil [52]	28,991	14.9	No local incidence data
Pakistan [53]	38,795	21	1.6 per 100,000 + 50% of candida peritonitis
Qatar [54]	288	15.4	15.4 per 100,000 from previous studies
Thailand [55]	8650	13.3	94% of non-neutropenic patients with fungaemia + 4.5% of neutropenic patients
Hungary [56]	1110	11	3–10 per 100,000 from previous studies + 780 cases in chronic ambulatory peritoneal dialysis
Israel [57]	664	11	Incidence rate obtained from a nationwide surveillance between 2005 and 2007 and adjusted to the number of ICU hospital days in 2012
Portugal [91]	231	2.2	Data from Portuguese multicentre survey [92]
Philippines [93]	1968	2	2 per 100,000 + 50% candida peritonitis

If 5 cases of candidaemia per 100,000, then 385,000 annual incidence.

But rate in India + Pakistan >20/100,000, so ~294,000 alone

in Brazil - $15/100,000 = 31,300$ cases

Translating candidaemia numbers into invasive candidiasis numbers

The pooled blood culture positivity rate in patients with IC was 0.38 (95%CI: 0.29 to 0.46)

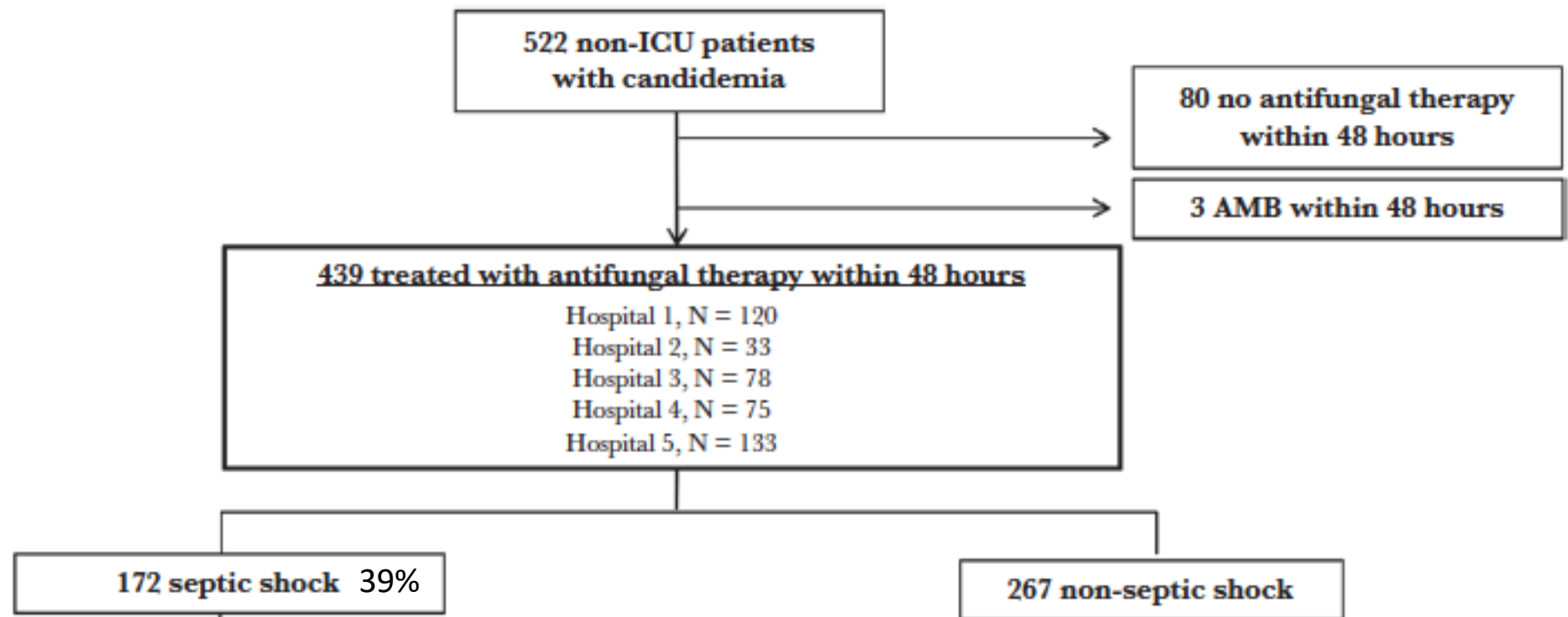
Avni et al. *J Clin Microbiol* 2011;49:665; Nguyen et al. *Clin Infect Dis* 2012;54:1240

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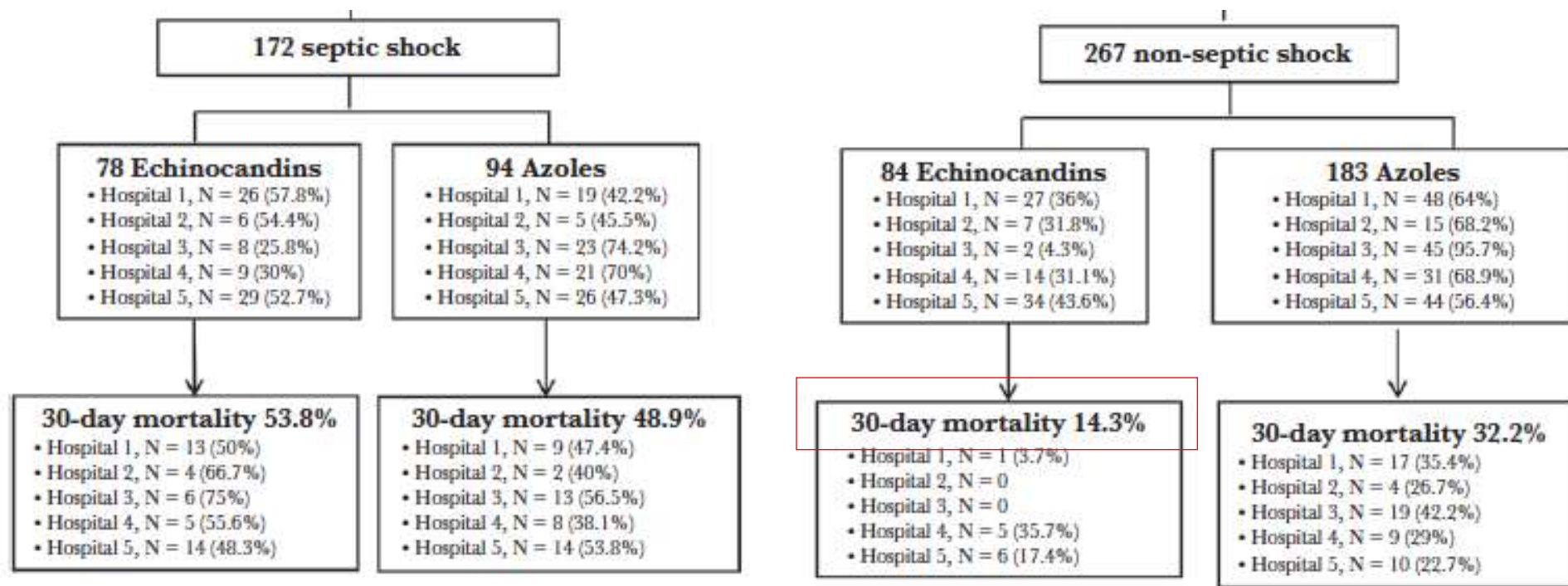
Impact of Initial Antifungal Therapy on the Outcome of Patients With Candidemia and Septic Shock Admitted to Medical Wards: A Propensity Score–Adjusted Analysis

Marco Falcone,¹ Tiseo Giusy,¹ Belen Gutiérrez-Gutiérrez,² Raponi Giammarco,³ Carfagna Paolo,⁴ Rosin Chiara,⁵ Luzzati Roberto,⁵ Delle Rose Diego,⁶ Andreoni Massimo,⁶ Farcomeni Alessio,³ Venditti Mario,³ Jesus Rodríguez-Baño,² and Francesco Menichetti¹; for GISA (Italian Group for Antimicrobial Stewardship)

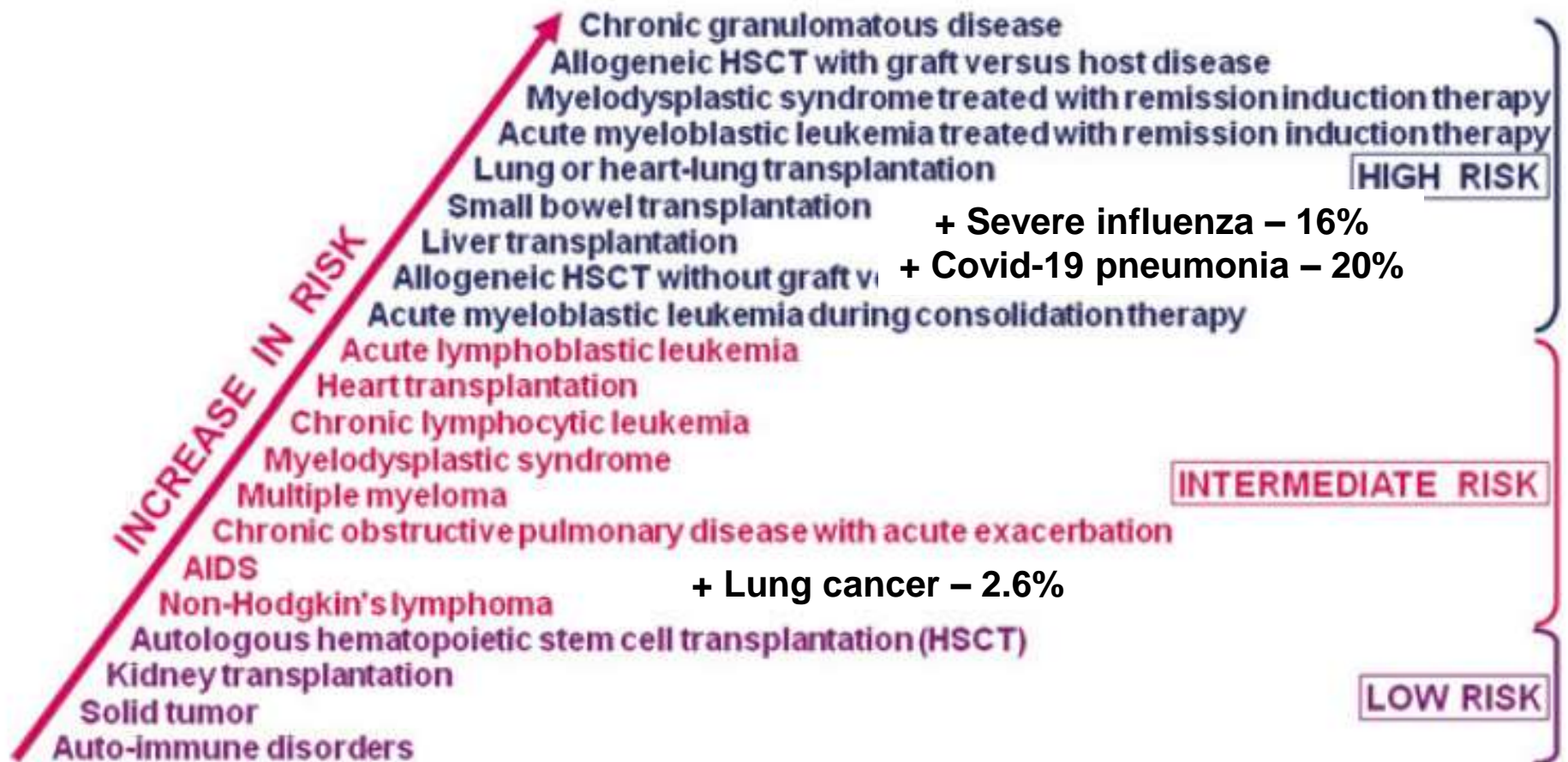


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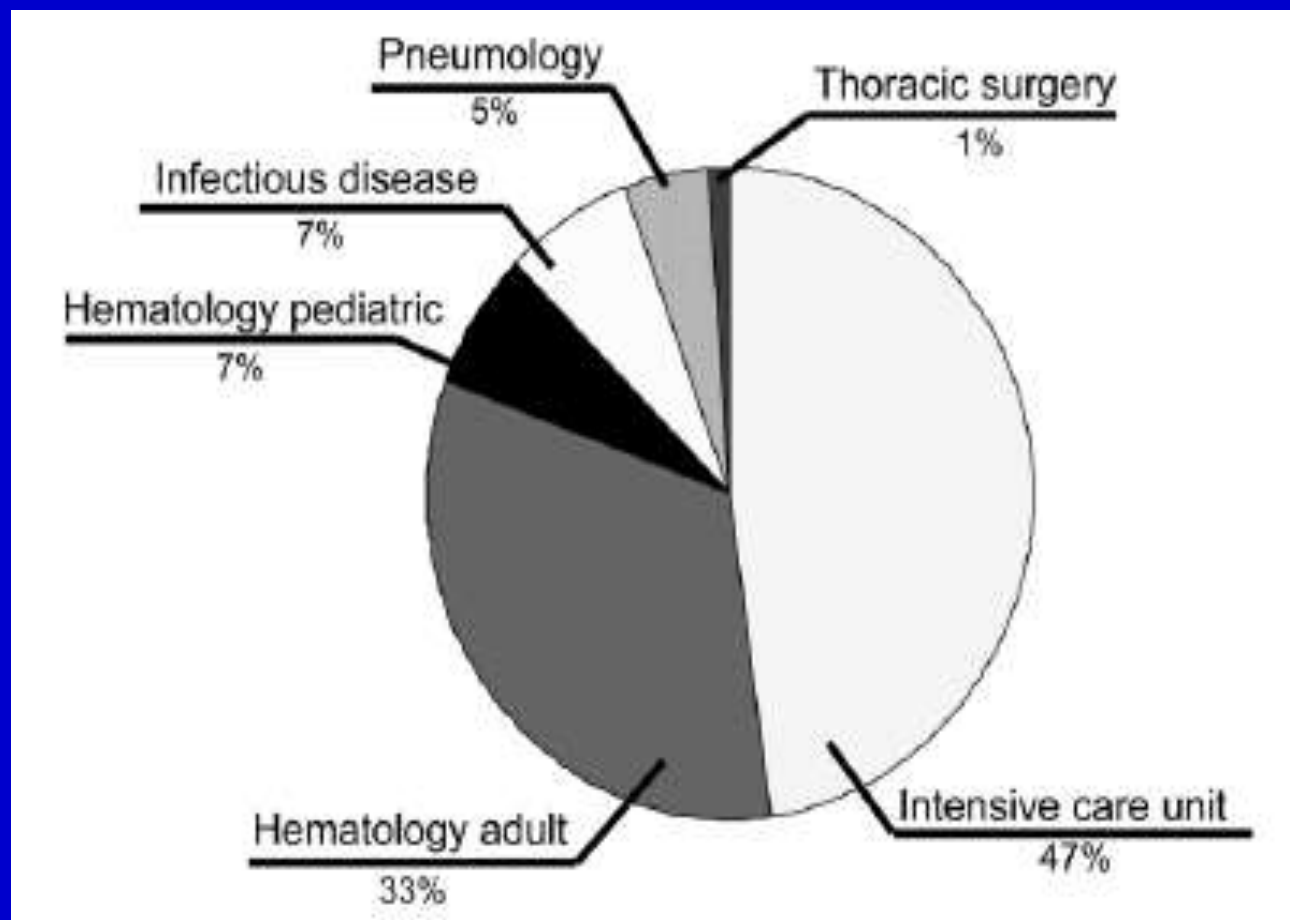
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Risk groups and frequencies of invasive aspergillosis - different test performances



Where in the hospital does invasive aspergillosis occur? Rennes, France



The global impact of *Aspergillus* infection on COPD


Emily E. Hammond^{1†}, Charles S. McDonald^{1†}, Jørgen Vestbo^{2,3} and David W. Denning^{2,4*} 

Table 1 A summary of the data in Table 1, by continent and an overall global estimate of COPD prevalence, hospitalisation rate, IA prevalence in COPD and associated mortality

Region	Population size [16]	COPD population GOLD stages II-IV n (% of population)	COPD annual hospitalisation rate [18] 10.5% of COPD population	IA annual rate [10, 20]		IA mortality rate [10, 20]		IA annual incidence per 100,000 population
				1.30–3.90% of COPD hospitalisation rate		n (% of IA cases)		
Africa	1,197,415,000	64,298,051 (5.37)	6,751,295	87,767	1.3%	62,929	71.7%	7.3
				271,877	3.9%	115,996	43.0%	22.7
America	1,001,386,000	85,278,783 (8.52)	8,954,272	116,406	1.3%	83,463	71.7%	11.6
				349,217	3.9%	150,163	43.0%	34.9
Asia	4,476,519,000	339,206,893 (8.58)	35,616,724	462,894	1.3%	331,895	71.7%	10.3
				1,389,052	3.9%	597,292	43.0%	31.0
Europe	765,958,000	59,484,329 (7.77)	6,245,855	81,196	1.3%	58,218	71.7%	10.6
				247,744	3.9%	106,530	43.0%	32.3
Oceania	37,131,000	4,032,543 (10.86)	423,417	5504	1.3%	3947	71.7%	14.8
				16,513	3.9%	7101	43.0%	44.5
Globally	7,478,409,000	552,300,599 (7.39)	57,991,563	753,073	1.3%	540,451	71.7%	10.0
				2,272,322	3.9%	977,082	43.0%	30.40



Invasive aspergillosis in COPD

ORIGINAL ARTICLE

MYCOLOGY

Invasive pulmonary aspergillosis in patients with chronic obstructive pulmonary disease: a case control study from China

H. Xu¹, L. Li¹, W.-J. Huang¹, L.-X. Wang², W.-F. Li¹ and W.-F. Yuan¹

1) Respiratory Medicine and 2) Clinical Laboratory, Guangzhou General Hospital of Guangzhou Military Command, Guangzhou, China

58 of the 298 COPD admissions with a lower respiratory tract sample processed grew *Aspergillus* spp.

39 (3.9%) had probable IA.

Only 13% had oral corticosteroids

43% died



New estimate of COPD, admissions to hospital and IA

551,800,000 patients with COPD GOLD stage II-IV
57,938,000 admissions to hospital (10.5% annually)

760,000 IA cases in COPD at a 1.3% rate (Spain)
2,272,000 IA cases in COPD at a 3.9% rate (China)

545,000 – 976,000 deaths predicted annually (43-71%)



Fungal disease of the lungs in outside the hospital

Fungal infection	Annual burden	Annual case fatality rate	Estimated deaths
Chronic pulmonary aspergillosis	>3,000,000	~15% mortality in developed world	>450,000



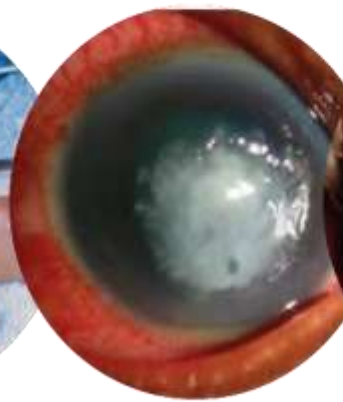
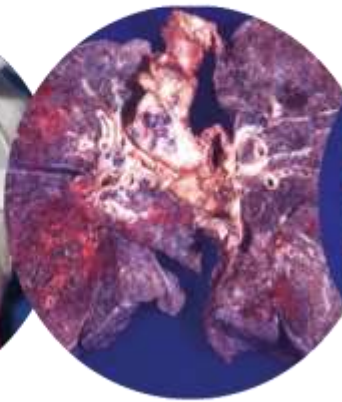
Fungal disease of the lungs in outside the hospital 'Fungal asthma'

Fungal infection	Annual burden	Annual case fatality rate	Estimated deaths
Chronic pulmonary aspergillosis	>3,000,000	~15% mortality in developed world	>450,000
SAFS	>6,500,000	<1% but no good figures	350,000 - 489,000 asthma deaths - ~50% SAFS related
ABPA (asthma)	>4,837,000	<1%	<10,000
ABPA & <i>Aspergillus</i> bronchitis (cystic fibrosis)	>19,000	<1%	<100
Total	>14 million		>700,000

~200 million adult asthmatics

Fungal asthma in children –
2% of 100 million

MILLIONS DIE NEEDLESSLY DUE TO FUNGAL DISEASE



13 million

people at risk of
fatal fungal infection
worldwide, daily



Over 2 million

fungal related deaths
annually.
5th biggest cause
of death



~50% of HIV deaths
are due to fungal
infections. So do many
with TB, cancer, leukemia,
COPD and in ICUs

Diagnosis



Treatment



1.3 million

Deaths averted from
fungal disease



GAFFI's vision

A world free from death
and suffering caused by
fungal disease

