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Poster Session I
Confronting fungal infections
BURDEN OF SERIOUS FUNGAL INFECTIONS IN DENMARK

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Objective

To estimate the annual burden of non-trivial and serious fungal infection in Denmark.

Method

National population data were obtained at www.statistikbanken.dk. Epidemiology surveys on candidaemia (Arendrup, Clin Microbiol Infect 2013) and dermatophytosis (Saunte, Acta Derm Venerol, 2008) were used. National data on fungal infections among HIV/AIDS patients were retrieved from national registries. Number of fungal infections among cancer, haematological and ICU patients were estimated based on the number of risk patients: Tuberculosis: <http://www.ssi.dk/Aktuelt/Nyhedsbreve/EPI-NYT/2012/Uge%2050%20-%202012.aspx>; COPD discharges and population with chronic pulmonary disease: the Health data and Information and Communication Technology website at the www.ssi.dk; Cystic fibrosis (CF): the CF foundation and a published review of the Danish CF centres; AML (Granfeldt, Clin Epi, 2013) and transplant data: transplant registries (<http://leukemia.dk> and www.organdonor.dk).

Results

Of Denmark's 5.6M population, 17% are children under 15 and 12% are women over 60. The number of invasive/systemic/deep fungal infections was estimated to be 1,201 (21.4/100,000 population, Table). Half of these involved *Candida* (assuming peritonitis adds 50% to the number of candidaemia cases in the ICU setting) and at least a third was due to acute (10% in AML, 0.5-4% in other haematological or transplant patients and 1.3% in hospitalised COPD) and chronic aspergillosis (assuming cases in TB patients account for 33%).

Allergic fungal disease cases (ABPA and SAFS) was estimated to be 16,133 assuming rates of ABPA of 2.5% in adult asthmatics (277,502 adults), 15% in CF patients (252 adults) and SAFS of 3.3% of adult asthmatics.

Finally, population data was used to estimate the number of recurrent *Candida* vaginitis 75,812 cases/year assuming a rate 6% in women between 15 and 50. Including the number of tinea capitis based upon stable nationwide rates reported in 1993 and 2003 a total of 75,997 superficial cases/year is estimated.

Denmark has approximately 4,800 people with HIV of whom 75% are on ART. Forty patients were diagnosed with AIDS in 2010. There are few AIDS-related opportunistic fungal infections: 17 PCP, one *Cryptococcus* meningitis and 6 oesophageal candidiasis cases/year in 2009-11. Also mucormycosis is a rare infection in Denmark (approx. 1/year).

Conclusions

Whereas the number of candidaemia cases and AIDS defining fungal infection in HIV patients are systematically surveyed, most fungal infections are unreported. To provide an impression of the overall fungal burden it is necessary to make some assumptions from known datasets and published literature. Based on available data approximately 2% of Denmark's population will have a non-trivial fungal infection during one year. Since most of our results are extrapolated from surrogate markers of fungal infection the model requires validation. However, it provides a standardised means of estimating and comparing the burden of disease across populations and underscores the magnitude of the fungal burden.

Infection	Number of infections per underlying disorder per year					Total Burden	Rate /100,000
	None/Other	HIV/AIDS	Respiratory	Cancer/Tx	ICU		
Invasive/systemic/deep infections						1,201	21.4
Candidaemia	84 [‡]			174 [‡]	269 [‡]	527	9.4
Candida peritonitis					176 [‡]	176	3.1
Mucormycosis				1		1	0.02
Cryptococcal meningitis		1		1		2	0.04
Pneumocystis pneumonia		17					
Invasive aspergillosis				65 [‡]	210 [‡]	274	4.90
Chronic pulm. aspergillosis			171 [‡]			171	3.05
Allergic disease						16,133	288
Allergic bronchopulmonary aspergillosis (ABPA)			6975 [‡]			6,975	125
Severe asthma with fungal sensitisation (SAFS)			9158 [‡]			9,158	163
Superficial infections often requiring systemic treatment						75,997	1,356
Oesophageal candidiasis		6				6	0.1
Recurrent Candida vaginitis (≥4x/year)	75,812 [‡]					75,812	2,706*
Tinea capitis	185					185	3.30
Total burden estimated	75,997	24	16,304	104	386	93,303	2,017

[‡] Indicates the number is an estimate based upon published prevalence rates and population/risk group sizes
^{*} Incidence per 100,000 women.