The Burden of Serious Fungal Infections in Ghana

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INTRODUCTION

- Fungal infections are often neglected by stake holders and governments especially in developing countries. In Ghana due to the absences and the cost of importing diagnostic tools and antifungal drugs, coupled with insufficient training of health-care staff, mortality and morbidity of fungal and other microbial infections occurs (Debourgogne *et al*., 2016). Many serious fungal infections (SFI's) are not noticed or diagnosed. This review was to create public health awareness on the impact of SFI's in the Ghanaian population.

METHODOLOGY

- A desktop review and analyses of the findings and recommendations from scholarly articles, projects' reports, conference and workshops' proceedings on fungal infections in Ghana was undertaken.
- We also used deterministic modeling of fungal diseases to estimate national incidence or prevalence in Ghana using the general population and specific at-risk groups (Denning, 2015).

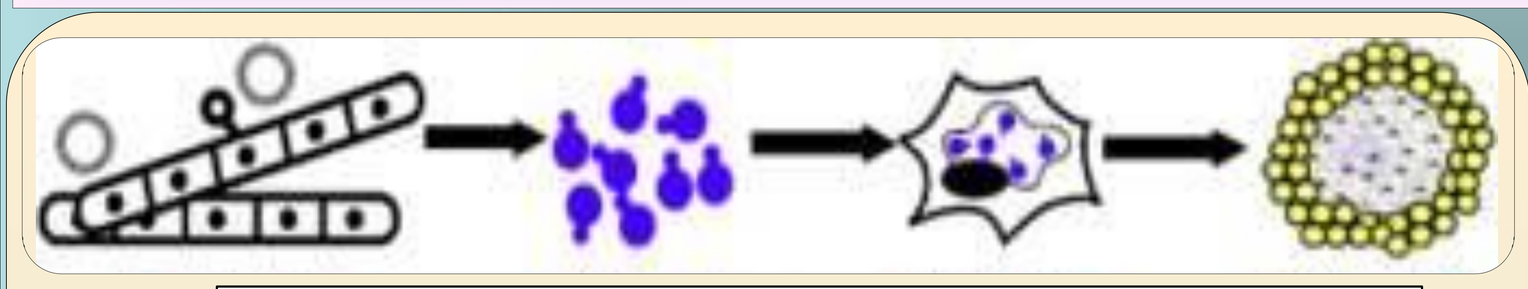
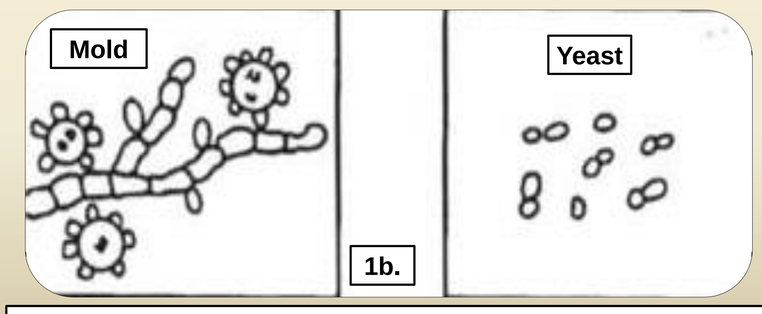
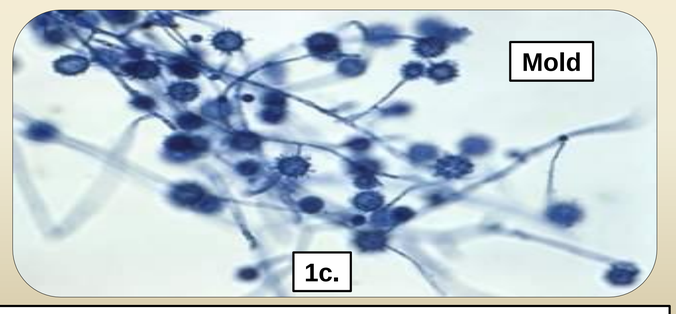


Fig. 1a. Various developmental stages of *Histoplasma i*nfections.





Figs. 1b-c. *Histoplasma dubosii* in the mold and yeast stages.

Table 1. Projected estimates of serious fungal infections in Ghana.

Type of serious fungal infections	Projected Estimates
Life-threatening invasive fungal infections.	30,000
Cryptococcal meningitis	6,275
Pneumocystis jirovecii pneumonia	11,737
Disseminated histoplasmosis cases in AIDS	724
Oral candidiasis and oesophageal candidiasis	18,292 Ghanaians with HIV infection
Allergic bronchopulmonary aspergillosis (ABPA)	18,385 in adult asthmatics
Severe asthma with fungal sensitisation (SAFS)	24,268 in adult asthmatics
Chronic pulmonary aspergillosis (CPA)	10,464 cases
Invasisve aspergillosis	277
Candidaemia	1,446
Candida peritonitis	217
Recurrent vulvovaginal candidiasis (RVVC)	442,621 cases among adult women
Tinea capitis	598,840 schoolchildren
Mucormycosis	58
Fungal keratitis	810 Ghanaians per year
Mycetoma or Chromoblastomycosis	No reliable data exist

RESULTS

- Our study revealed about 4% of the estimated 28.3 million Ghanaian population (Ghana Statistical Service, 2012) suffer from SFI's yearly with about 30,000 affected by life-threatening invasive fungal infections. A generalized HIV prevalence of 2.4% in adults and 14,550 TB cases (Ghana AIDS Commission, 2016: WHO, 2017).
- We estimate an annual incidence of 6,275, 11,737 and 724 Cryptococcal meningitis, *Pneumocystis jirovecii* pneumonia and disseminated histoplasmosis cases in AIDS respectively (Table 1; Figs. 1a-c).
- Oral candidiasis and oesophageal candidiasis was estimated to collectvely affect 18,292 Ghanaians with HIV infection. In adult asthmatics, 18,385 and 24,268 adults were estimated to have allergic bronchopulmonary aspergillosis (ABPA) and severe asthma with fungal sensitisation (SAFS) respectively.
- We estimated a prevalence of 10,464 cases of chronic pulmonary aspergillosis (CPA) with 50% assumed to occur post tuberculosis and an anual incidence of 277 cases of invasisve aspergillosis.
- Candidaemia and candida peritonitis cases were estimated to be 1,446 and 217, respectively. We estimated a prevalence of 442,621 recurrent vulvovaginal candidiasis (RVVC) cases among adult women (Table 1).
- We estimated that 598,840 school children suffer from *Tinea capitis* (Figs 2a-c). Mucormycosis and fungal keratitis were estimated to occur in 58 and 810 Ghanaians, respectively per year. No reliable data exist on mycetoma (Fig. 2d) or chromoblastomycosis.

Fig. 2. Superficial infections a = Tinea pedis (T. rubrum), b = Onynchomycosis, c = T. capitis, d = Mycetoma

DISCUSSION & CONCLUDING REMARKS

- SFI's in Ghana are probably more common than expected with over 1,100,000 Ghanaians suffering from SFI's.
- Further epidemiological studies and surveillance programs as well as registers for at risk groups are urgently needed (Agyepong, 2018) to confirm or adjust our estimate.
- In view of these, increased awareness is essential. Clinicians must expand their knowledge of fungal infections and be equipped with the necessary clinical expertise in fungal disease diagnosis and management especially life threatening invasive fungal infections in Ghana.

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References

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