

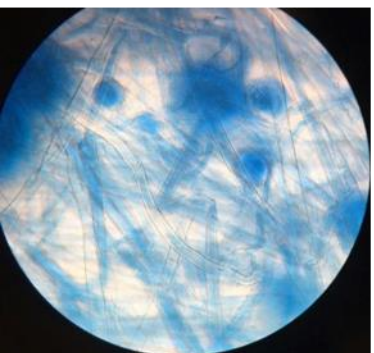


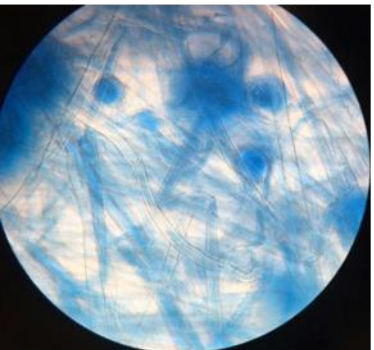
Sampling with passive methods – An added value for the exposure assessment to fungal burden

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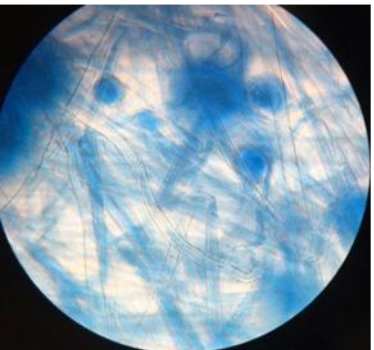
1. Background

In several workplaces, air-conditioning systems are crucial to maintain a comfortable indoor environment.

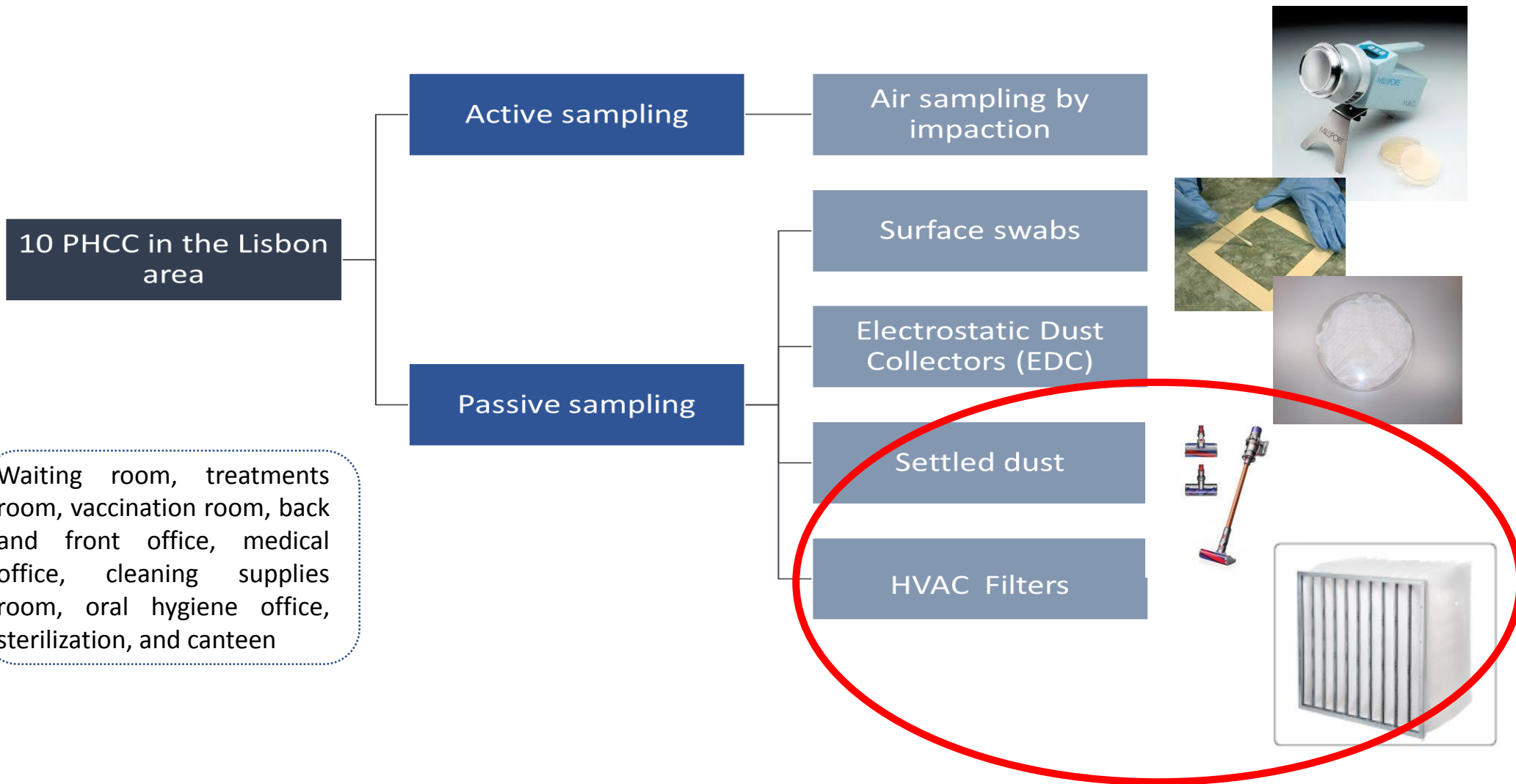
These devices are often contaminated with microorganisms, which they discharge indoors contributing for the fungal dissemination.

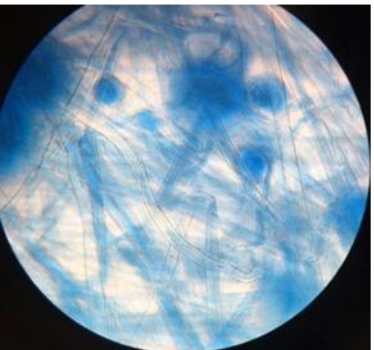
(Hamada and Fujita 2002)



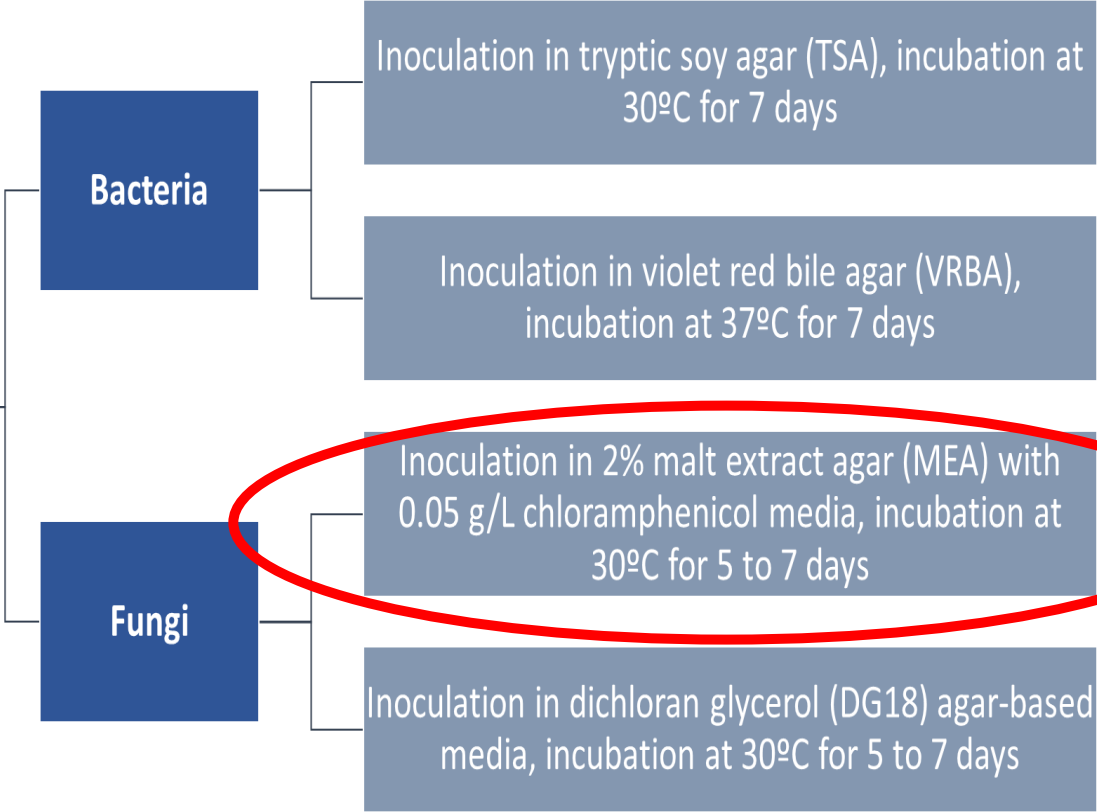


2. Materials and methods





Bioburden exposure assessment in 10 PHCC



- Other performed assessments in the same matrices:**
- Fungal biomass
 - Toxigenic fungal strains detection
 - MRSA prevalence (all passive methods)
 - Azole resistance prevalence among the recovered mycobiota
 - Mycotoxins
 - Endotoxins

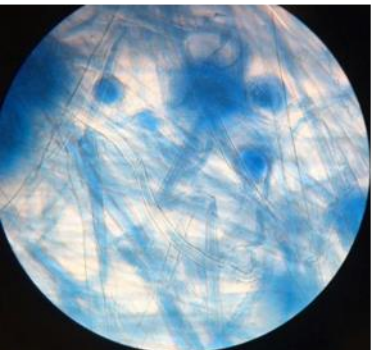


Some fungal species identified in HVAC filters and settled dust were not identified on air samples (data not shown).

Fungal species found exclusively on HVAC filter or settled dust samples in each PHCC

PHCC	HVAC filters	Settled dust
1		<i>C. sitophila</i>
		<i>Chrysonilia sp.</i>
		<i>Aspergillus section Versicolores</i>
2	<i>Geotrichum sp.</i>	<i>C. sitophila</i>
		<i>Stemphiliium sp.</i>
3	<i>Aspergillus section Flavi</i>	<i>Ulocladium sp.</i>
	<i>Phoma sp.</i>	
4		<i>Ulocladium sp.</i>
7		<i>C. sitophila</i>
		<i>Chrysonilia sp.</i>
8	<i>Chrysosporium sp.</i>	
	<i>Geotrichum sp.</i>	
9	<i>Syncephalastrum racemosum</i>	
	<i>Ulocladium sp.</i>	





4. Main findings discussion

- Bioburden sampling protocols must include, besides air sampling (active methods), passive methods such as HVAC filters and also settled dust.

(Reponen, 2017)

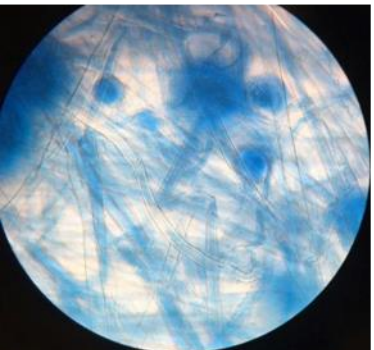
- Distribution of bioburden recovered from HVAC filters differed substantially from that found in settled dust samples.

(Noris et al, 2011; Hospodsky et al., 2012).

- It was observe more than one fungal species isolated only in each passive method that were not found on air sampling.

- Three of these species – *Aspergillus* sections *Flavi* and *Versicolores* and *Ulocladium* sp. - indicators of harmful fungal contamination.

(AIHA, 1996)

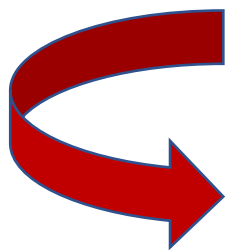


- IAQ assessors and most of industrial hygienists use air sampling as stand-alone method hindering a proper and suitable risk characterization.

(Viegas et al., 2017, 2018)

- Data presented focus only on viable mycobiota and culture-based studies potentially underestimated results.

(Rintala et al., 2008; Górný et al., 2016; Degois et al., 2017).

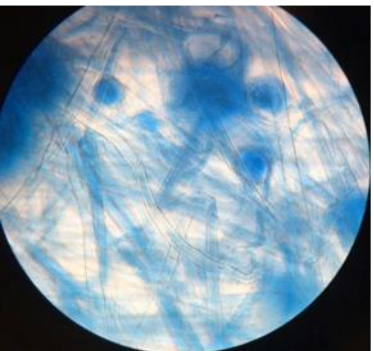


They allow to obtain information on cultivable and infectious organisms being fundamental in exposure assessment studies.

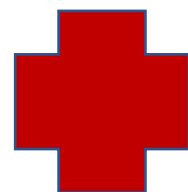
(Samson et al., 2000; Eduard and Halstensen, 2009)

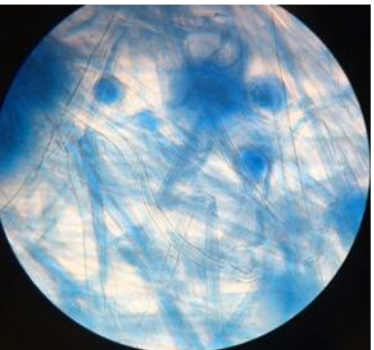


5. Take home messages



WRONG!





Look deep into nature (indoor environment), and then you will understand everything better.

Albert Einstein

18 Junho at ESTeSL – EXPOsE Seminar

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