Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

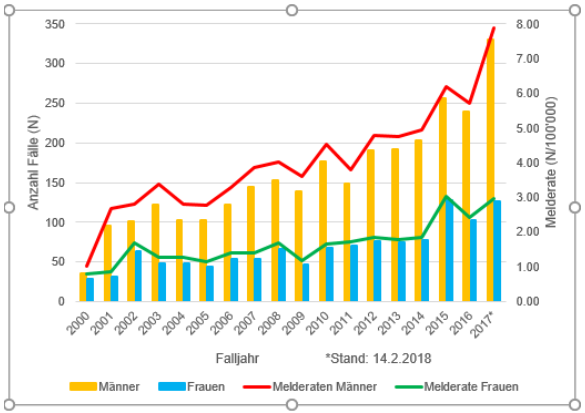
Federal Department of Home Affairs FDHA
Federal Food Safety and Veterinary Affairs FSVO

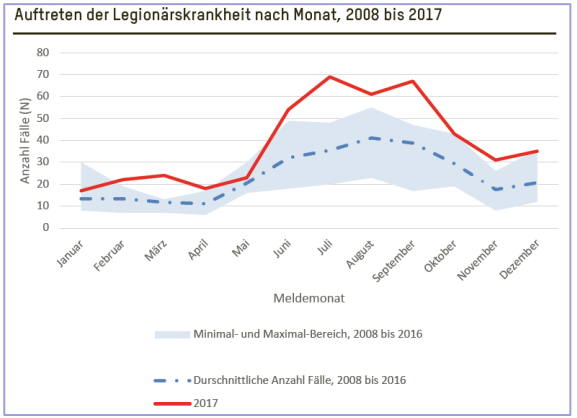
A tool to identify sources of *Legionella* contamination ?

Protocol on Water and Health
Meeting of the Parties, Side Event
November 21, 2019 in Belgrade

Pierre Studer
Federal Food Safety and Veterinary Office SFVO

Situation in Switzerland





BAG-Bulletin, 22.5.2019

2017: Legal requirements concerning *Legionella* in water (public showers and pools)

Category	Parameter	Limit
Water in baths or pools heated above 23 ºC with aerosol formation	*Legionella spp.*	100 CFU/l
Steam bath (spa): Water production with aerosol formation	*Legionella spp.*	100 CFU/l
Water in showers	*Legionella spp.*	1'000 CFU/l

TBDV, Anhang 5

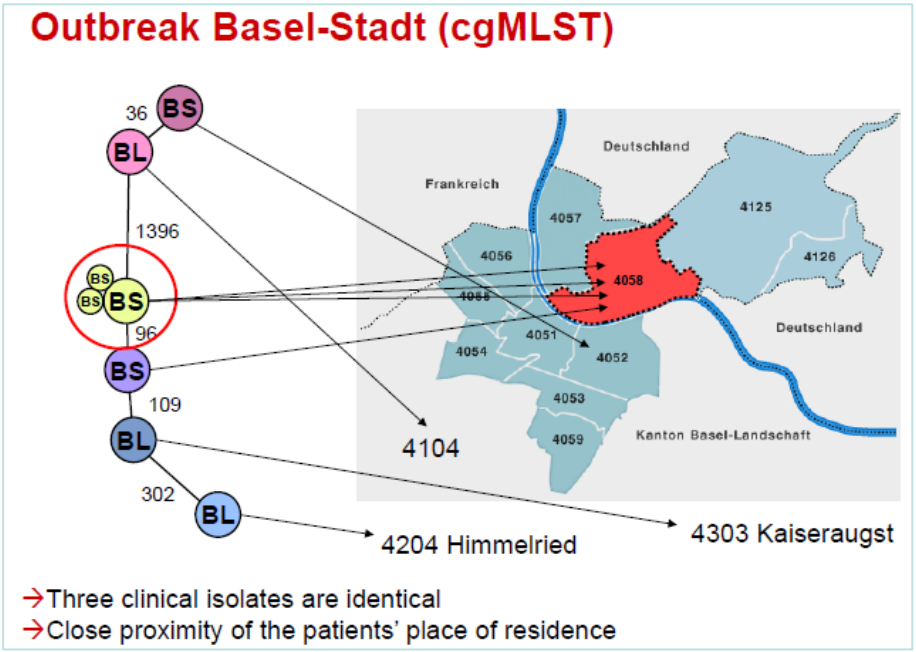
Whole Genom Sequencing (WGS)

New investigation tool for:

- Legionella strains identification
- Source identification and containment of outbreaks
- Characterization of the (patient) environment: Identification and comparison of strains

=> Database management is essential

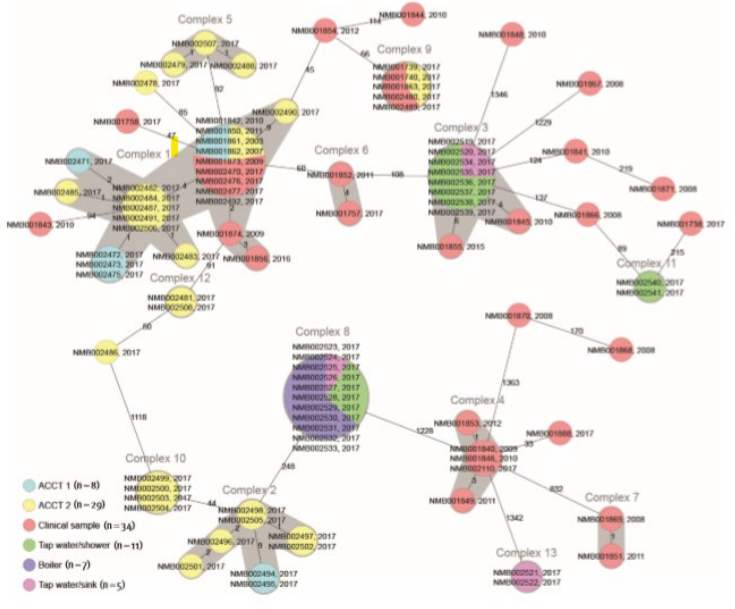
Identification of the contamination source



Legionella strains mapping in Basel (2003-2017)

FIGURE

Allelic differences between the *Legionella pneumophila* strains recovered in clinical and environmental isolates, Switzerland, 2003–2017 (n = 94 isolates)



ACCT: air-conditioner cooling towers; cgMLST: core genome multilocus sequence typing.

The circles represent sequenced strains. The circles are coloured according to the isolation source. The numbers next to the lines connecting two circles indicate the number of allelic differences. Strains that have no allelic differences are listed in the same circle. Strains with so or less allelic differences are clustered into complexes and connected with a grey background. The analysis is based on the published cgMLST scheme [15] for *Legionella pneumophila* using 1,521 allelic loci. The last four numbers next to the isolate ID indicate the isolation year

Lessons learned

- The regulation on showers and pools does not cover all cases
- Identification of contamination sources requests sophisticated investigations
- The environmental conditions (cooling towers, waste water, car washstations,…) can be problematic

Collaboration is necessary between
Health-, Energy- and Environment-Authorities

Literature

- Air-conditioner cooling towers as complex reservoirs and continuous source of Legionella pneumophila infection evidenced by a genomic analysis study in 2017, D. Wüthrich at all, Switzerland
- Management of legionella in water systemes (US Academic Sciences-2019)