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**UNIVERSITÄT
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40 years of disease diagnostics in Switzerland

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**Workshop EU Reference Laboratories for Fish Diseases
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Diagnostic data of the National Fish Disease Laboratory

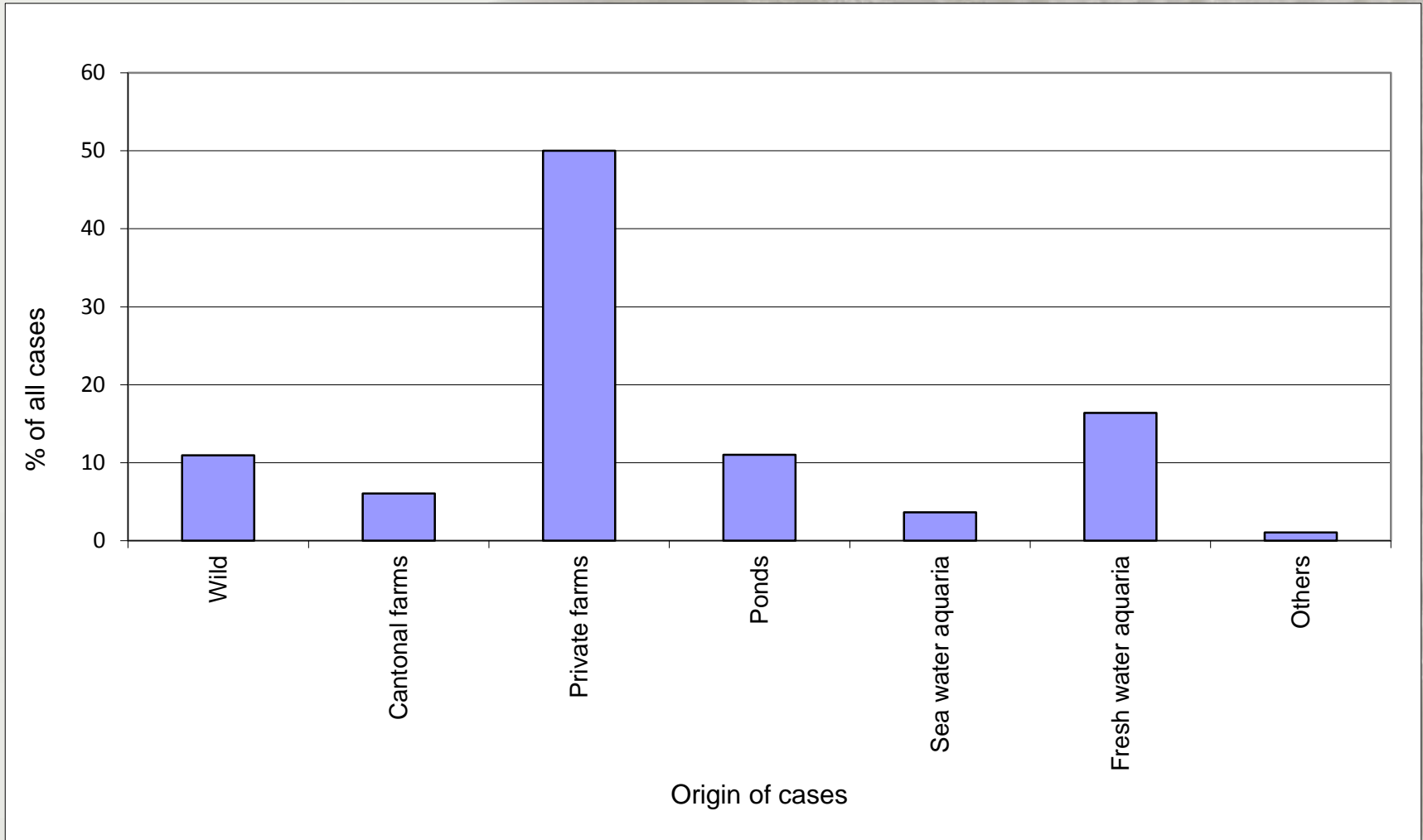
- National Fish Disease Laboratory (NAFUS) founded in 1975
- Reason for establishment
 - Major losses of wild fish due to ulcerative dermal necrosis
 - High number of cases with viral haemorrhagic septicaemia
- Since 1978 results of diagnostic work recorded in a database (1978-1984 retrospectively)
- Data based on cases (not individual fish)
- Database allows evaluation of diagnostic data over a period of 40 years
- Current presentation based on this database
- Total of > 16'000 cases



Willy Meier
First head of NAFUS

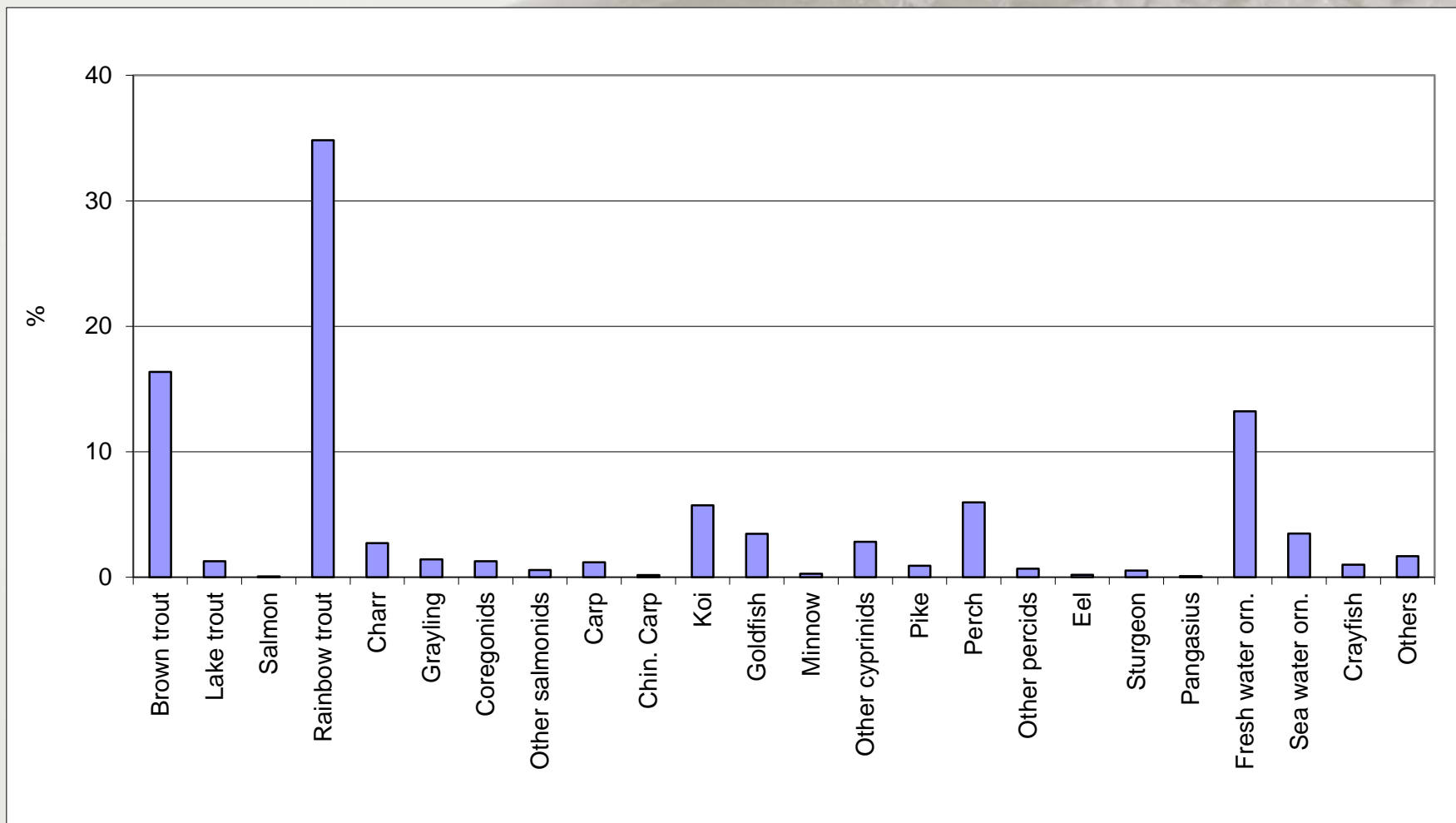
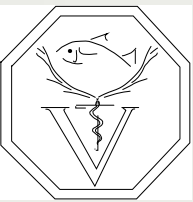
Origin of cases

All cases from 1978 to 2017



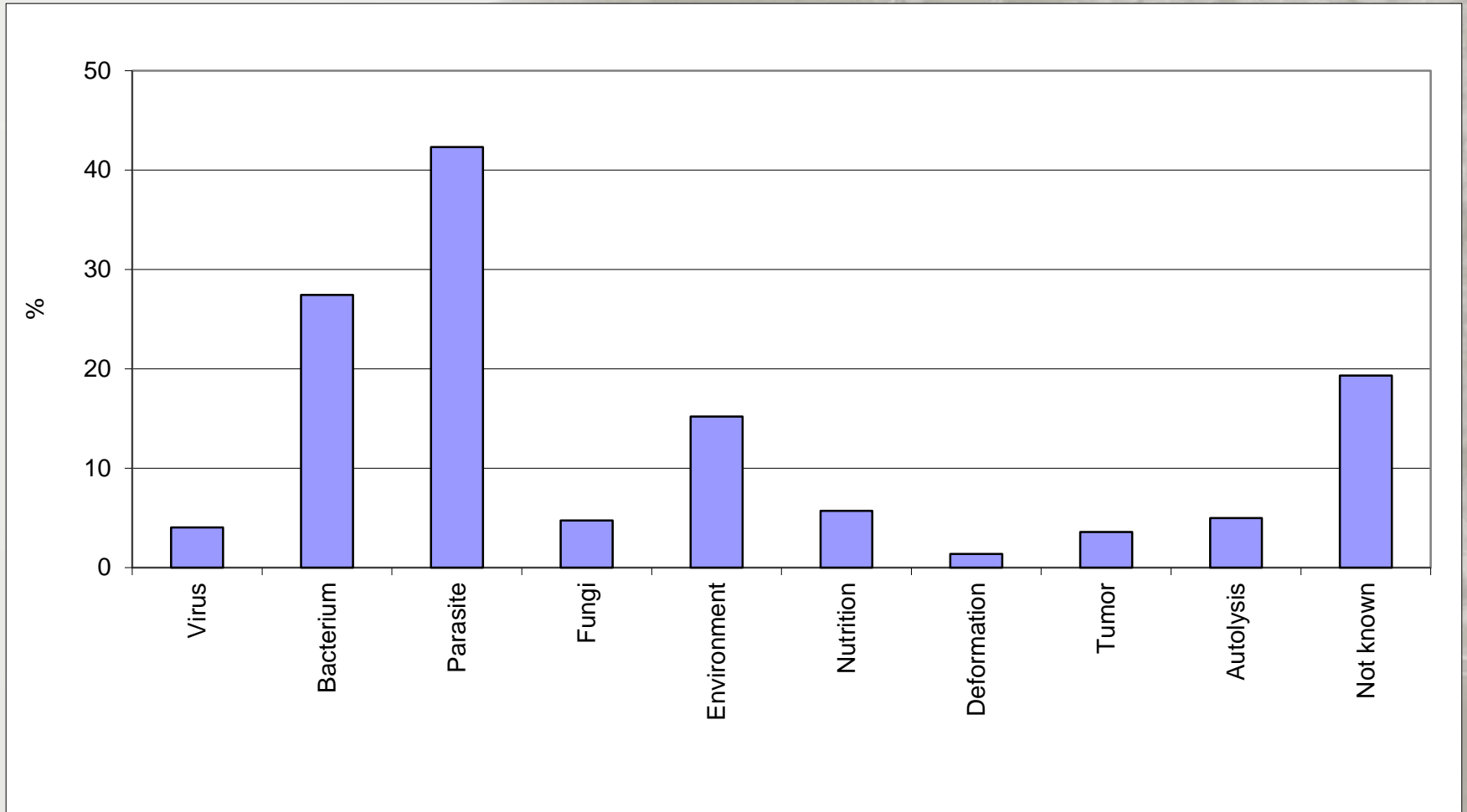
Species analysed

All cases from 1978 to 2017



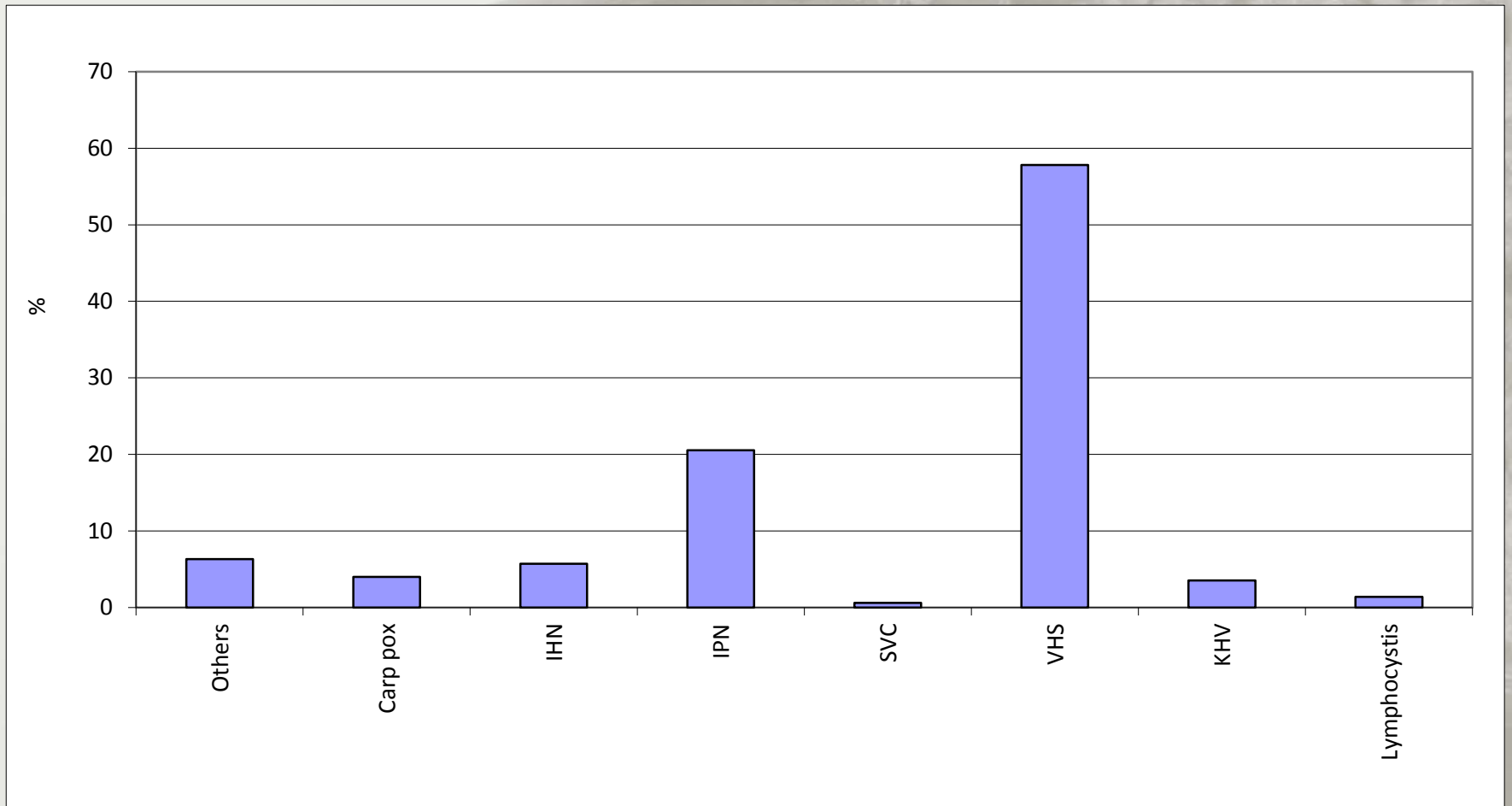
Diagnoses

All cases from 1978 to 2017



Viral diseases

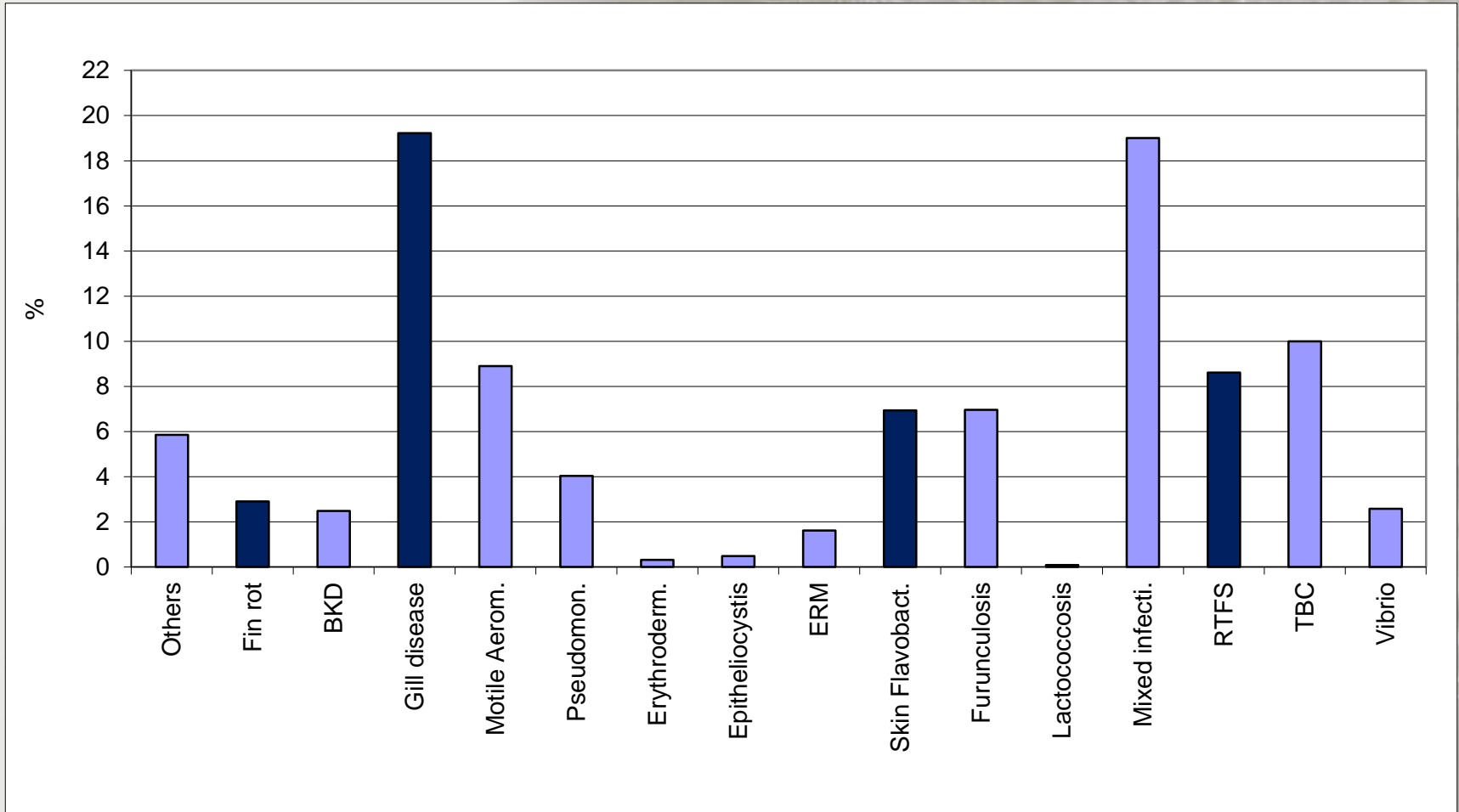
All cases from 1978 to 2017



N = 647

Bacterial infections / diseases

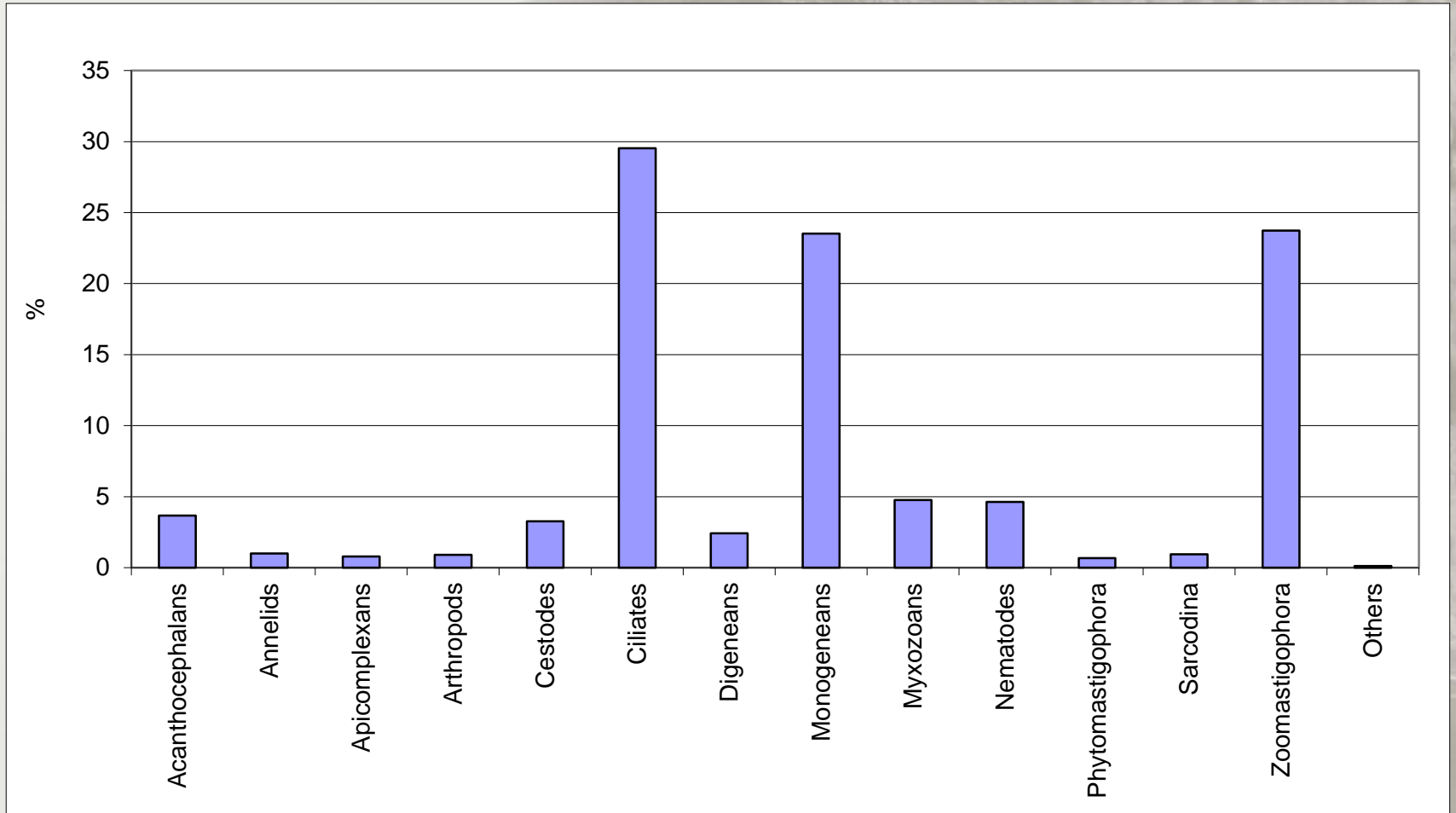
All cases from 1978 to 2017



N = 5400

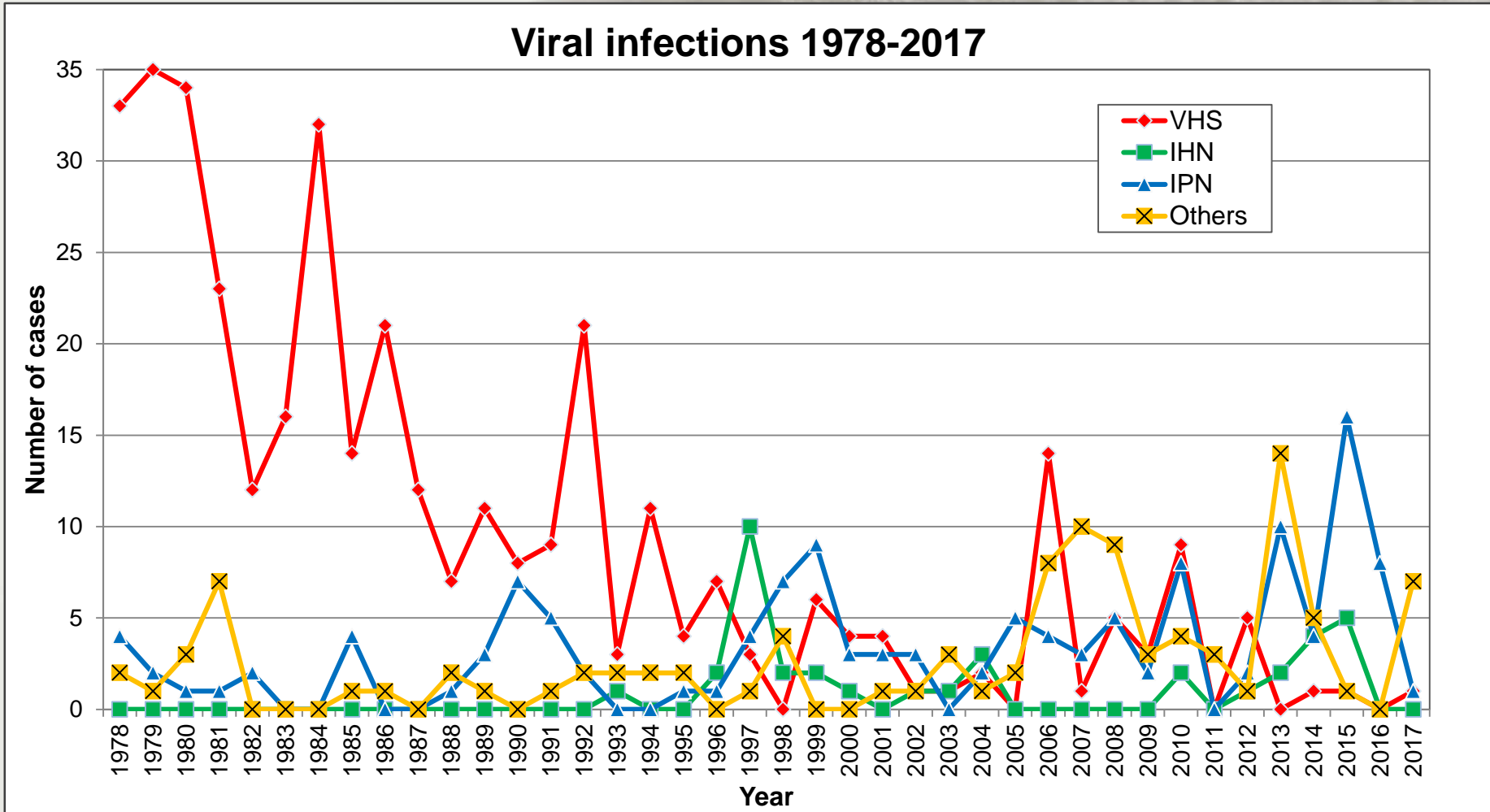
Parasitic infections / diseases

All cases from 1978 to 2017



N = 11'819

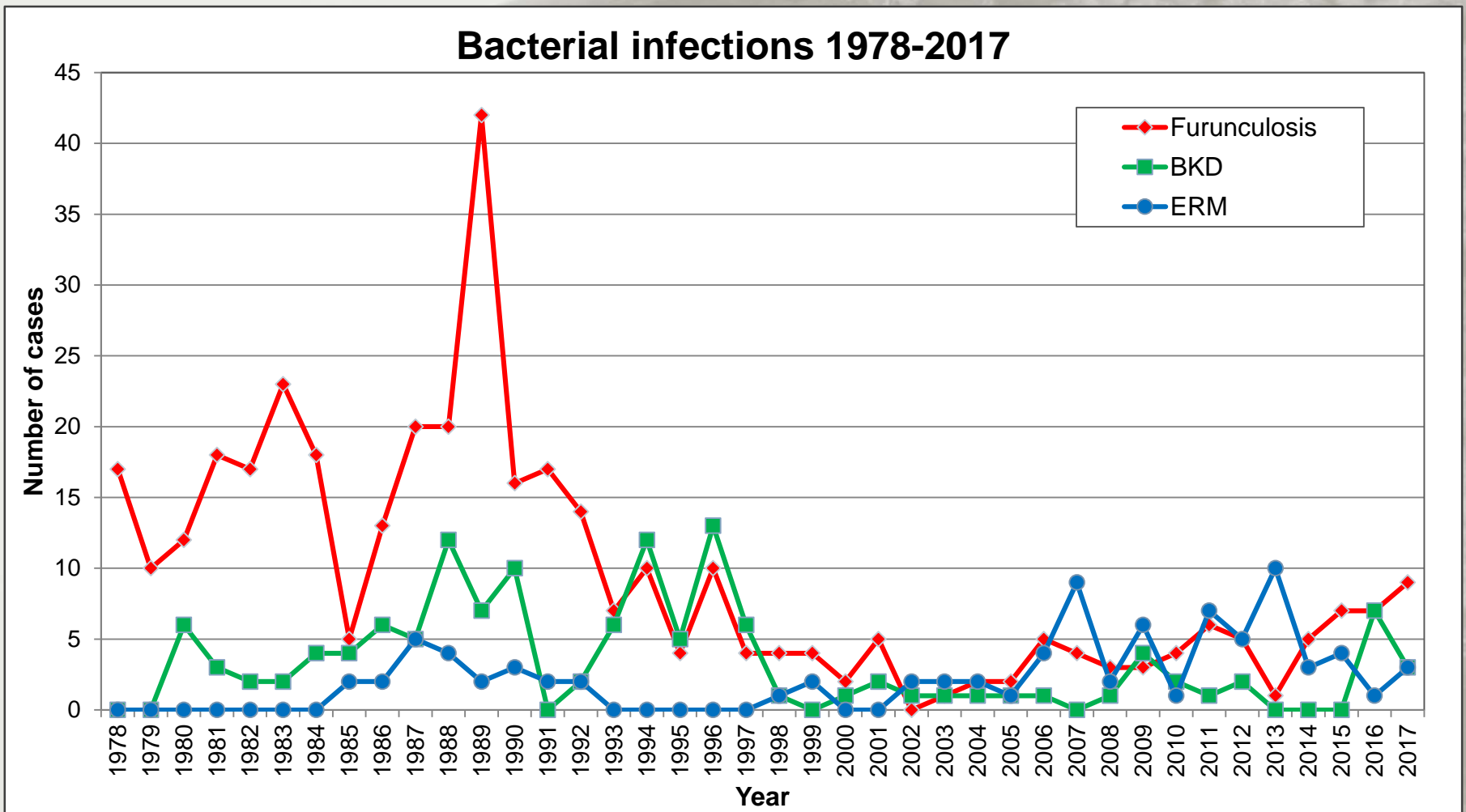
Occurrence of viral diseases over a period of 40 years



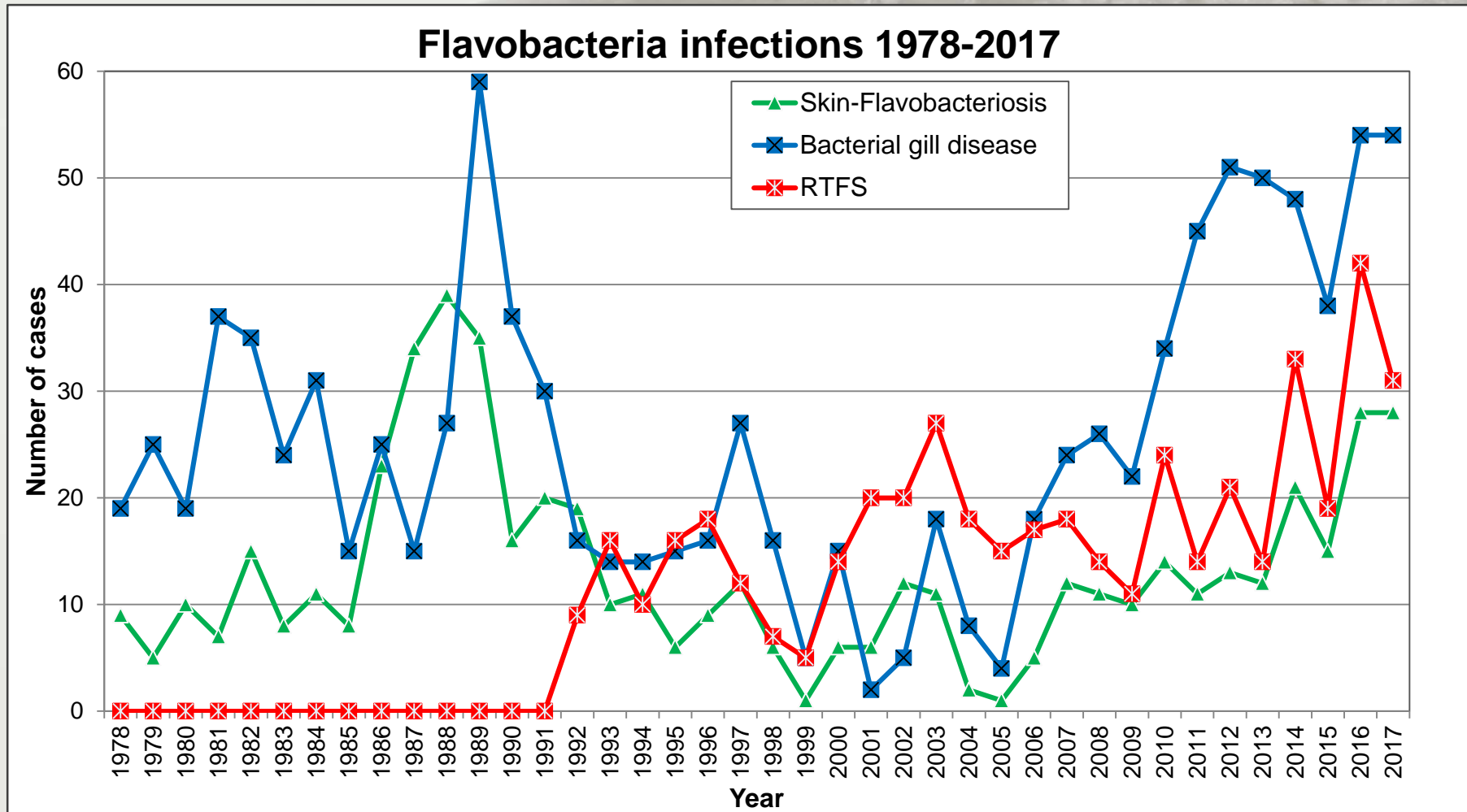
Viral infections: specific remarks

- First case of SVC in 1980; since then 3 further cases only
- First case of IHN in 1993, since then irregular detections of the causative virus
- First case of KHV in 2003, since then regular detections of single cases
- First case of CEV in 2007 (retrospectively in archive material); regular findings of single cases since 2016
- First case of Sturgeon herpes virus in 2009; further cases in 2010, 2013 and 2014
- First case of CyHV 2 in 2011, further cases in 2017
- First cases of salmonid alpha virus in 2013, further cases in 2014
- First case of Perchrhabdo virus in 2013, further cases in 2017 and 2018, (1 suspect in 1994 from a wild perch)

Occurrence of bacterial infections over a period of 40 years



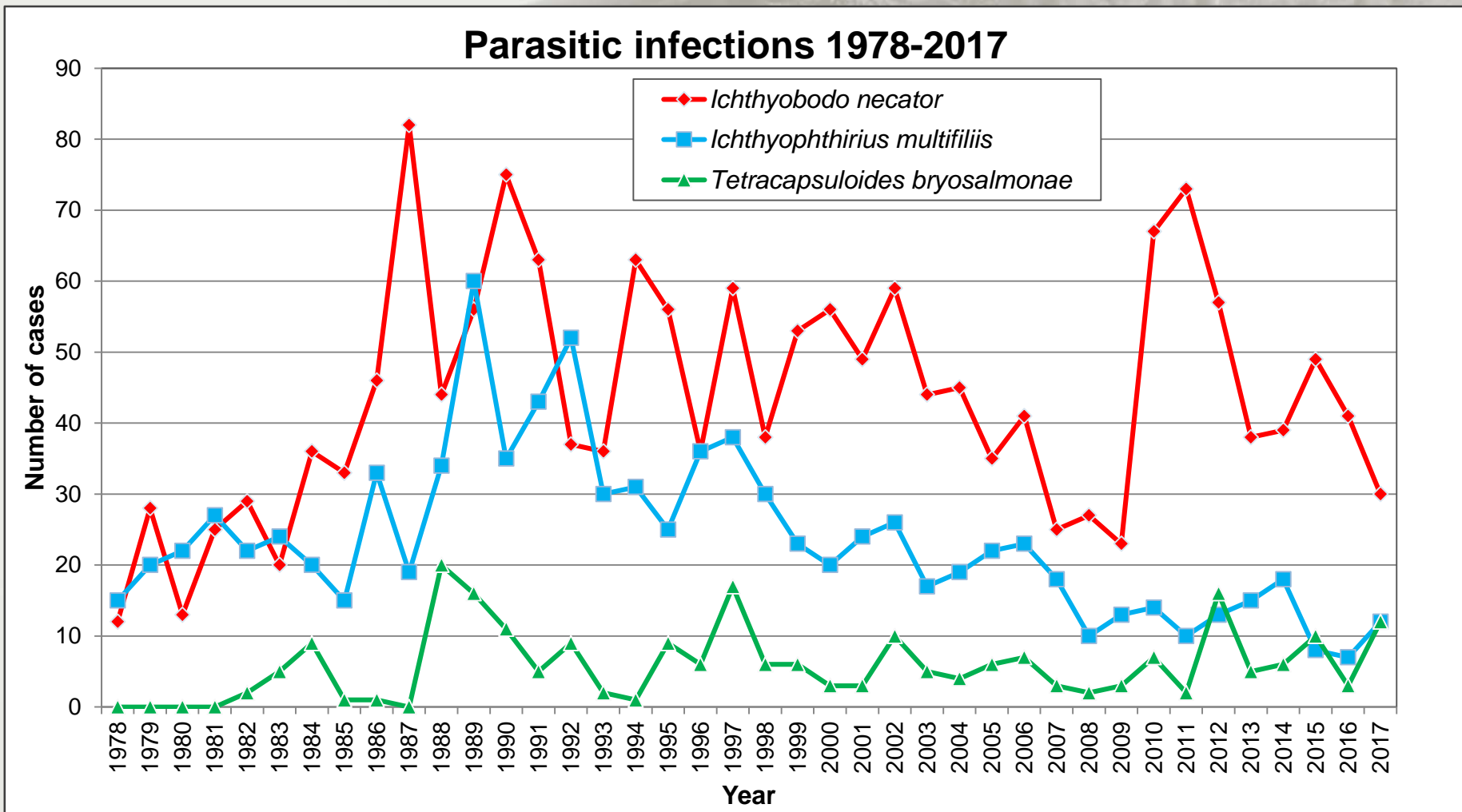
Occurrence of bacterial infections over a period of 40 years



Bacterial infections: specific remarks

- Furunculosis, BKD and ERM constantly detected in Switzerland but in low number of cases
- First case of RTFS in 1992 (possibly disease not recognized as such before)
- Flavobacteria infections increasing problem; always *F. psychrophilum*
- First case of *Lactococcus garvieae* in rainbow trout in 2003, no further cases in trout; further cases in perch in 2010 (no mass mortalities)
- In 2015 case of *Francisella noatunensis* ssp. *orientalis* in Tilapia

Occurrence of parasitic infections over a period of 30 years



Parasitic infections: specific remarks

- In fish farms *Ichthyobodo necator* and *Ichthyophthirius multifiliis* main problems among parasitic infections
- Increasing numbers of cases with *Spiroucleus* however consequences for affected fish not clear
- PKD mainly problem in wild fish, only few farms affected (only farms fed with river water)
- First detection of amoeba in fish-farm in 2007, further cases in 2010-2013 and in 2015
- Problems with scuticociliates in ornamental fish

Concluding remarks

- Over the 40 year period regular appearance of new diseases
- Only few diseases disappeared e.g. UDN never found again
- Establishment or development of new methods allows more reliable detection of pathogens (e.g. viral infections, mycobacteria, flavobacteria, microsporidia, scuticociliates, *Tetracapsuloides*)

- Diagnostics of fish diseases remains an interesting but challenging task