

FAO TCP/INT/3501: Strengthening biosecurity governance and capacities for dealing with the serious shrimp infectious myonecrosis virus (IMNV) disease

FAO/MAPA/ABCC

“Second Interregional Workshop of FAO TCP/INT/3501: IMNV”

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Qingdao, China (Intercontinental Hotel)

Surveillance on major shrimp diseases in China

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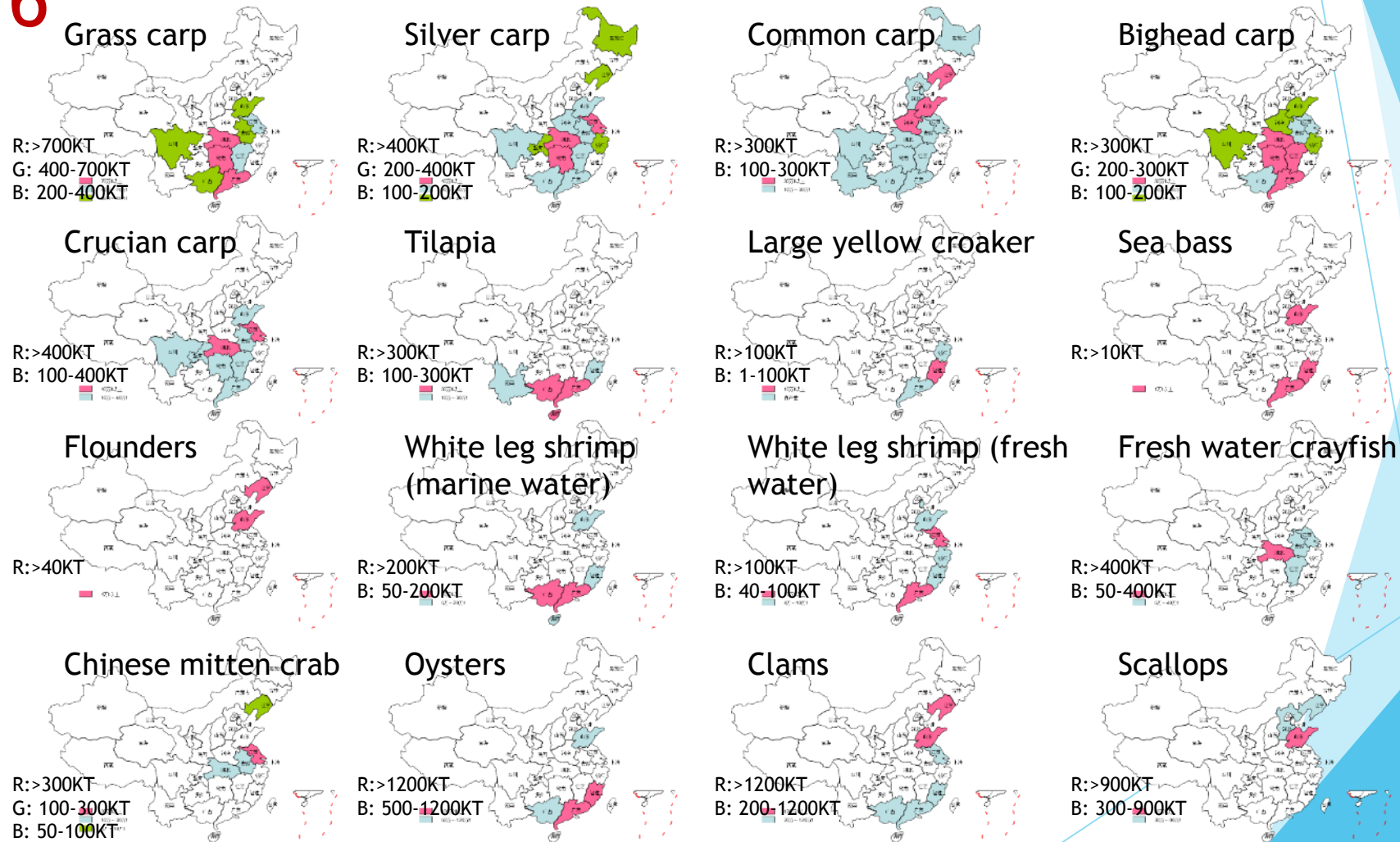
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Aquaculture in China in 2016

- ▶ Aquatic products: 69.01 million tons
- ▶ Aquacultural products: 51.42 million tons, 74.5% of total aquatic products
 - ▶ Mariculture: 19.63 million tons, 38.2%
 - ▶ 4.7% increasing than 2015
 - ▶ Freshwater aquaculture: 31.79 million tons, 61.8%
 - ▶ 3.8% increasing than 2015
 - ▶ Pond farming: 25.23 million tons, 49.1%
- ▶ Aquaculture area: 8.35 million hm²
 - ▶ Mariculture area: 2.17 million hm², 26.0%
 - ▶ Freshwater area: 6.18 million hm², 74.0%

From: BOF, Aquatic Animal Health in China 2016

Distribution of major aquaculture species in 2016



From: BOF, Aquatic Animal Health in China 2016

Aquatic Animal Health Services in China

- ▶ Authorities
 - ▶ Veterinary authority: Bureau of Veterinary, MOA
 - ▶ Competent authority for aquatic animal health: Bureau of Fisheries and Fisheries Law Enforcement (BOF), MOA
 - ▶ Competent authority for transboundary quarantine: Administration of Quality Supervision, Inspection and Quarantine
 - ▶ Local authorities for aquatic animal health: Administrative Department for Fisheries of each county
- ▶ Aquatic Animal Disease Control Centers
 - ▶ National center: National Fishery Technical Extension Center
 - ▶ Provincial centers: Independent provincial aquatic animal disease prevention centers or disease prevention department under the fishery technical extension centers of provinces or provincial fishery research institutes
 - ▶ Municipal centers: Total 195 aquatic animal disease prevention laboratories were established under 332 municipal centers for aquaculture technology extension stations
 - ▶ County levels: Total 602 aquatic animal disease prevention stations were established under 628 aquaculture technology extension stations supported by central government.
- ▶ Aquatic Animal Disease Control Support Institutions
 - ▶ Reference laboratories: 3 OIE RLs for WSD, IHNN, and SVC, 3 ministerial key laboratories for marine and freshwater animal disease control.
 - ▶ Laboratories for aquatic animal health in institutions and universities
 - ▶ Aquatic Animal Pathogen Collection Center
 - ▶ Five Aquatic Organism Disease Divisions under National Agriculture Technology Development Systems on 5 aquatic organism species
 - ▶ Provincial and municipal quarantine centers or laboratories under AQSIQ

From: BOF, Aquatic Animal Health in China 2016

Aquatic Animal Health Experts and Professionals

- ▶ Expert Commission for Aquaculture Disease Control under MOA
- ▶ Standardization Workgroup for aquatic animal disease under the National Aquaculture Standardization Commission
- ▶ Professionals
 - ▶ Licensed Veterinaries for aquatic animals: 1886
 - ▶ Licensed Veterinary Assistants: 1206
 - ▶ Registered village veterinaries: 16183

Aquatic Animal Disease Surveillance

- ▶ Aquatic animal disease monitoring and reporting
 - ▶ Passive surveillance program based on clinical signs
 - ▶ Total 31 provinces participate the monitoring and reporting program of aquatic animal diseases
 - ▶ Total 4122 reporting sites, reporting personnel 2322 persons
 - ▶ Reporting area cover 300 kha aquaculture area
 - ▶ Monitoring information was published via Chinese journals, website for Chinese Aquaculture Information and Remote Diagnosis Network for Aquatic Animal Diseases of China
 - ▶ Total 9 issues of Monthly Report for Aquacultural Animal and Plant Diseases were published, 7 issues of National Prediction Information for Aquaculture Disease
- ▶ Targeted surveillance program for aquatic animal diseases
 - ▶ Active surveillance program based on molecular detection.

Aquatic Animal Disease Situation by Monitoring and Reporting in 2016

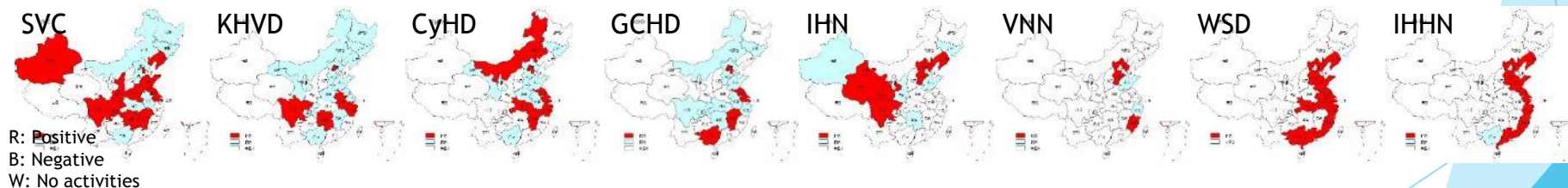
- ▶ Passive surveillance based on clinical signs
- ▶ Disease occurred in total 72 aquatic species
- ▶ There were 92 diseases were reported
- ▶ Total losses caused by diseases were about CNY27.3 billion

	Viral disease	Bacterial disease	Fungal diseases	Parasite diseases	Total
Fish	11	18	2	17	48
Shrimp	5	9	1	3	18
Crabs	1	4	1	1	7
Mollusks	2	3		1	6
Amphibians/reptiles	3	8		1	12
Algae		4			4
Sea cucumber		3			3
Sum					98

From: BOF, Aquatic Animal Health in China 2016

National Aquatic Animal Disease Surveillance Plan in 2016

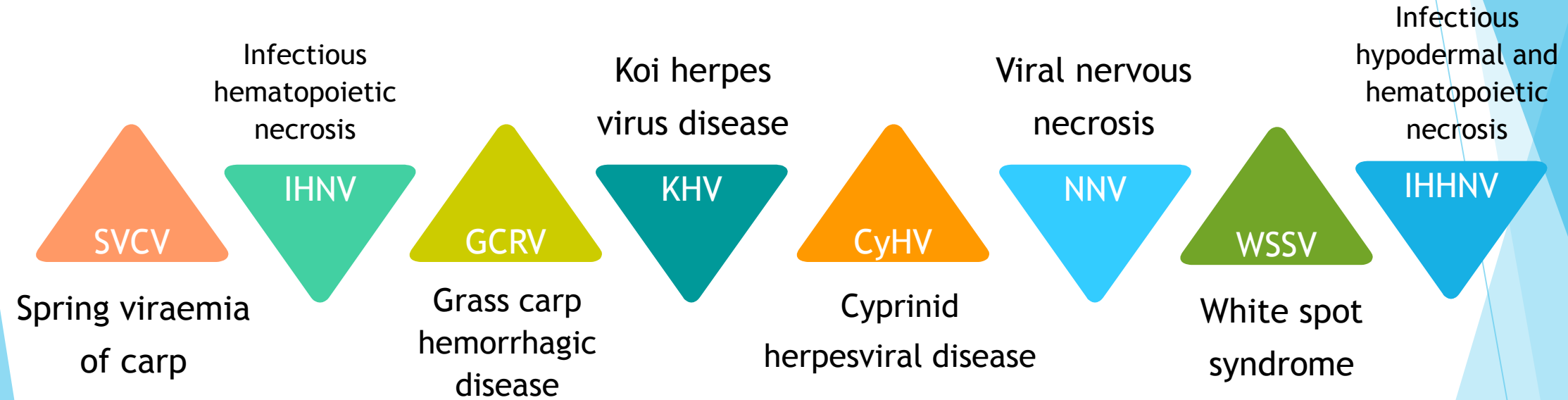
- ▶ Active surveillance based on molecular detection
- ▶ Surveillance situation
 - ▶ Fish diseases
 - ▶ SVC: 20 provinces, 282 counties; 666 sites, 5.3% positive.
 - ▶ KHVD: 18 provinces, 160 counties; 453 sites, 1.8% positive.
 - ▶ CyHVD: 16 provinces, 167 counties; 414 sites, 8.0% positive.
 - ▶ GCHD: 16 provinces; 463 sites, 5.0% positive.
 - ▶ IHN: 11 provinces, 58 counties; 238 sites, 13.9% positive.
 - ▶ VNN: 5 provinces, 30 counties; 87 sites, 8.1% positive.
 - ▶ Crustacean diseases
 - ▶ WSD: 12 provinces, 142 counties; 661 sites, 16.2% positive.
 - ▶ IHHN: 10 provinces, 79 counties; 503 sites, 12.9% positive.
 - ▶ Surveillance has been extended to EHP and SHIV in 2017.



- ▶ Risk analysis and suggestions
 - ▶ Hatcheries for fish and shrimp larva are the important risk sources for disease spreading.
 - ▶ Quarantine for fish and shrimp larva in production loci need to be started and enhanced.

From: BOF, Aquatic Animal Health in China 2016

8 major aquatic animal diseases on the list



Involved laboratories

- ▶ Joint work between
 - ▶ 8 national extension agencies,
 - ▶ 6 research institutes
 - ▶ 1 university laboratory
 - ▶ 7 entry-exit inspection and quarantine laboratories

单位名称

北京市水产技术推广站

北京出入境检验检疫局检验检疫技术中心

天津市水生动物疫病预防控制中心

河北省水产品质量检验检测站

吉林出入境检验检疫局检验检疫技术中心

中国水产科学研究院黑龙江水产研究所

上海市水产技术推广站

江苏省水生动物疫病预防控制中心

连云港出入境检验检疫局综技中心

浙江省水生动物防疫检疫中心

杭州市水产技术推广总站

福建省淡水水产研究所

福州市海洋与渔业技术中心

山东省淡水渔业研究院

山东出入境检验检疫局检验检疫技术中心

中国水产科学研究院长江水产研究所

湖北出入境检验检疫局检验检疫技术中心

湖南出入境检验检疫局检验检疫技术中心

中国水产科学研究院珠江水产研究所

广西渔业病害防治环境监测和质量检验中心

四川农业大学

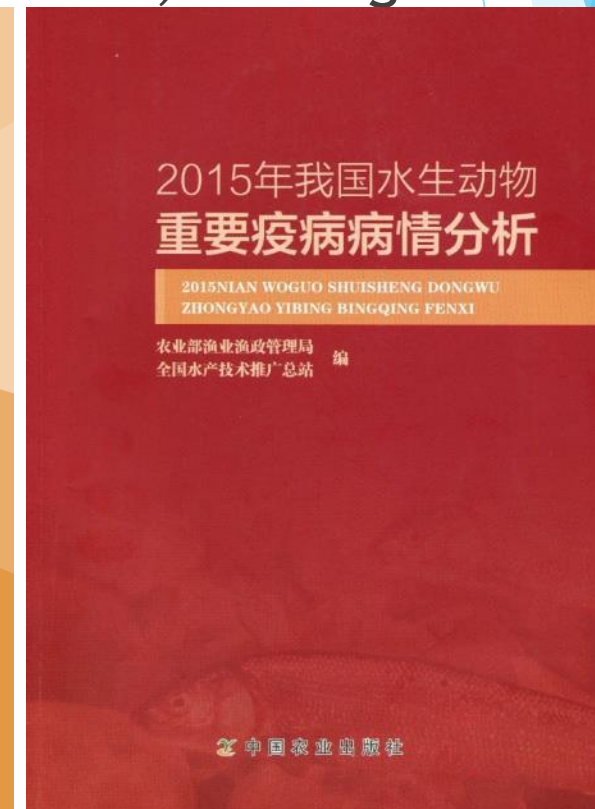
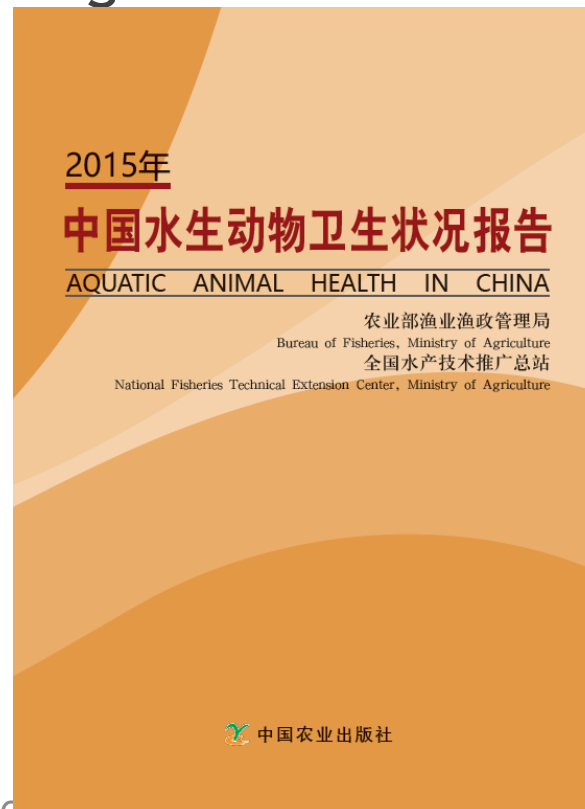
深圳市渔业服务与水产技术推广总站

深圳出入境检验检疫局检验检疫技术中心

中国水产科学研究院黄海水产研究所

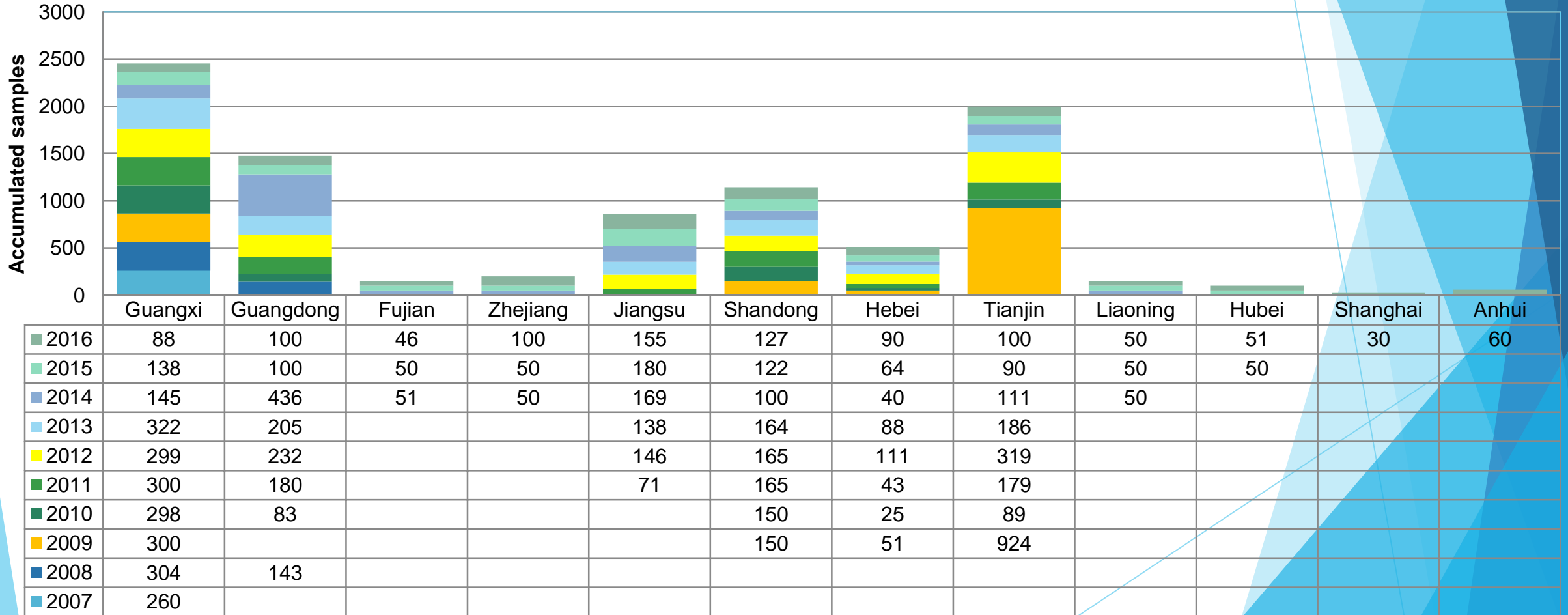
Analysis reports

- ▶ From the year of 2013, based on the survey and surveillance project, National reference laboratories and chief experts were designated by MOA, responsible for analyzing the surveillance data, writing the annual report for each disease.



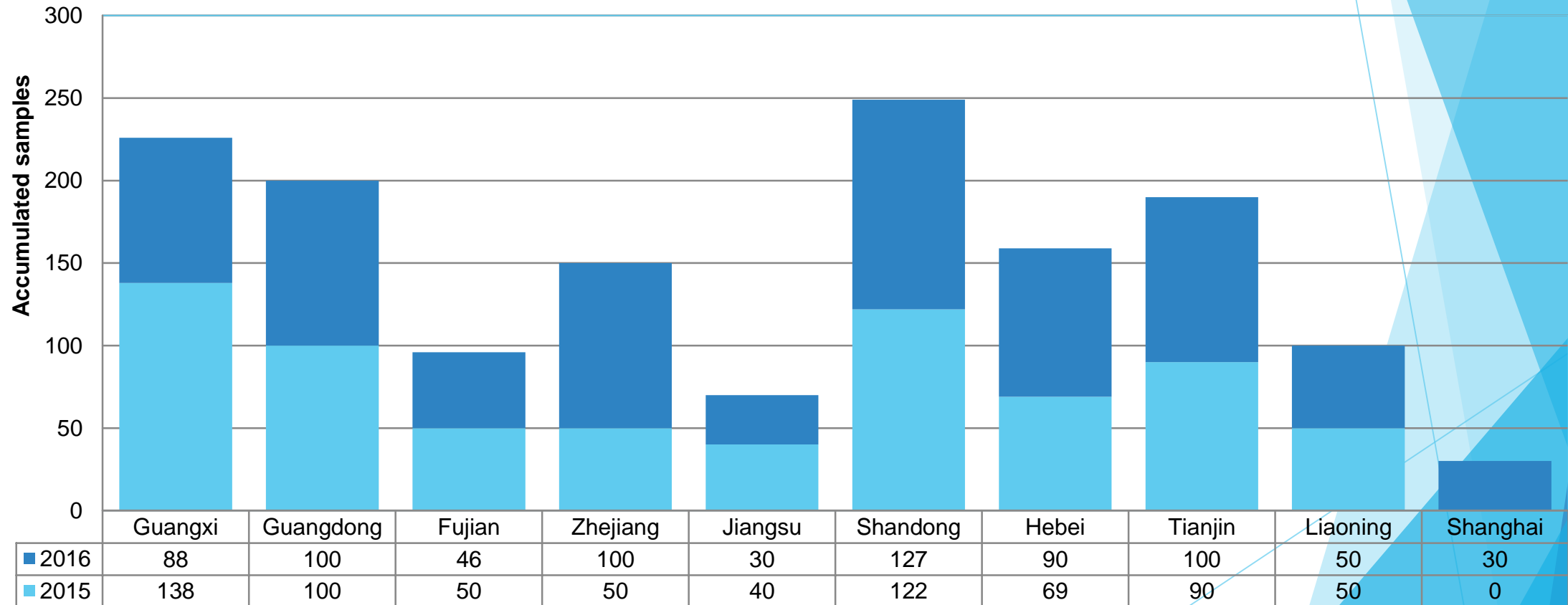
Results—sampling

WSSV: 12 provinces, 586 counties, 1152 villages, 4704 monitoring points, 9133 samples



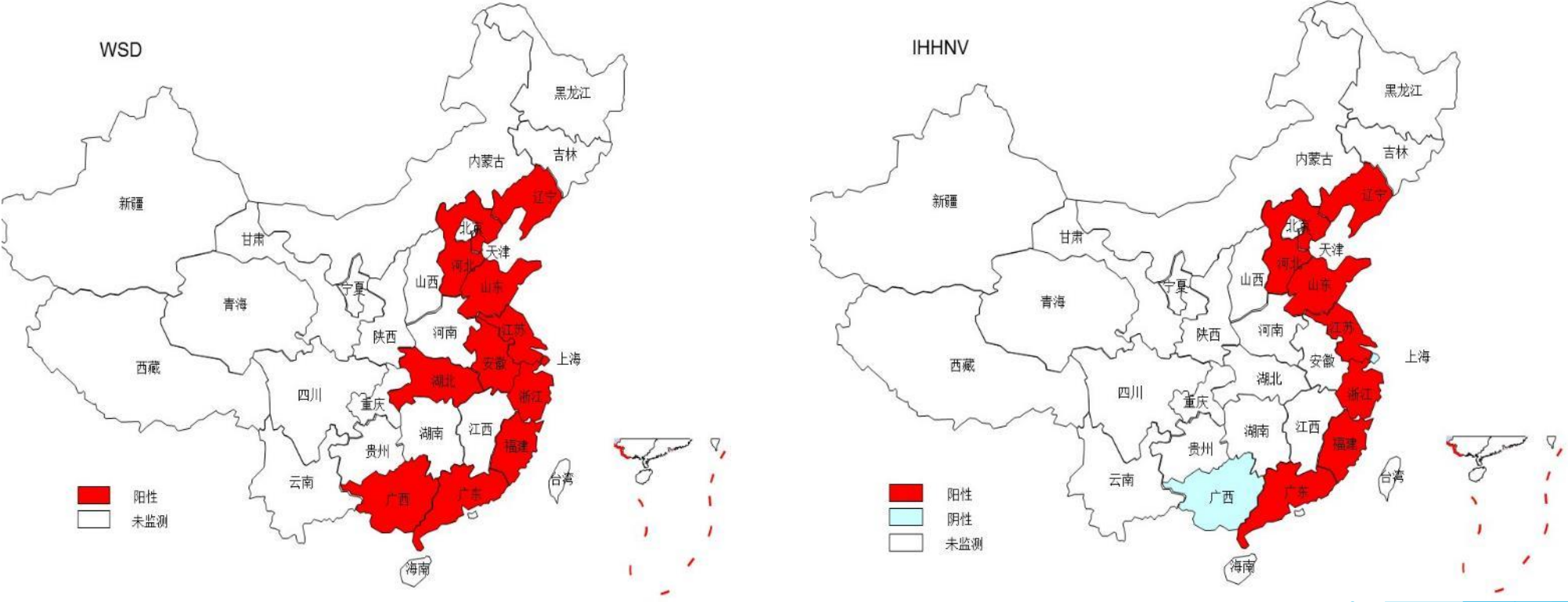
Results—sampling

IHHNV: 10 provinces, 141 counties, 291 villages, 915 monitoring points, 1470 samples



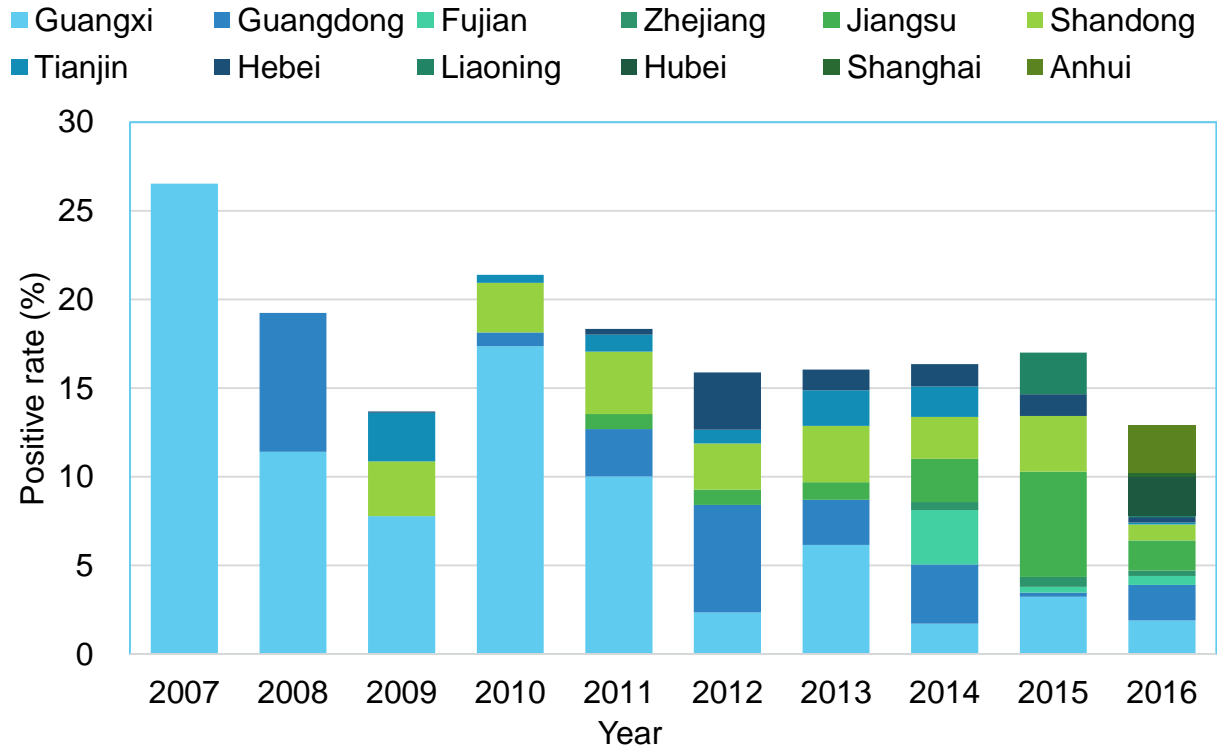
Provinces and samples for IHHNV surveillance from 2015 to 2016

Results—distribution

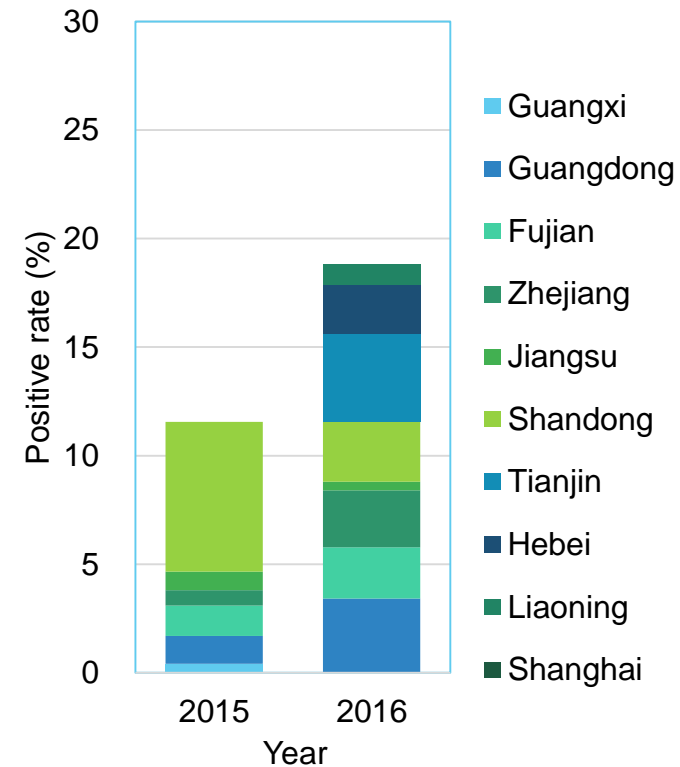


Distribution of provinces for WSSV and IHNV surveillance in China

Results—positive rate



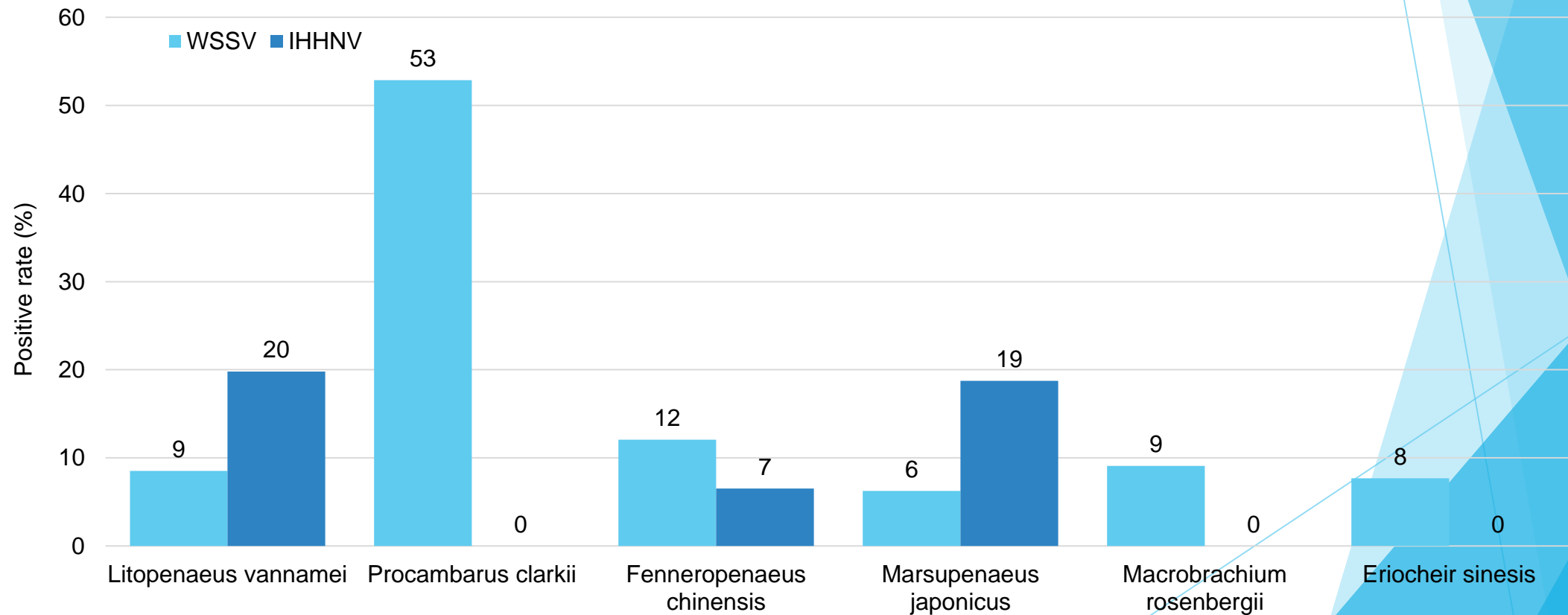
Positive rate of WSSV in China from 2007 to 2016



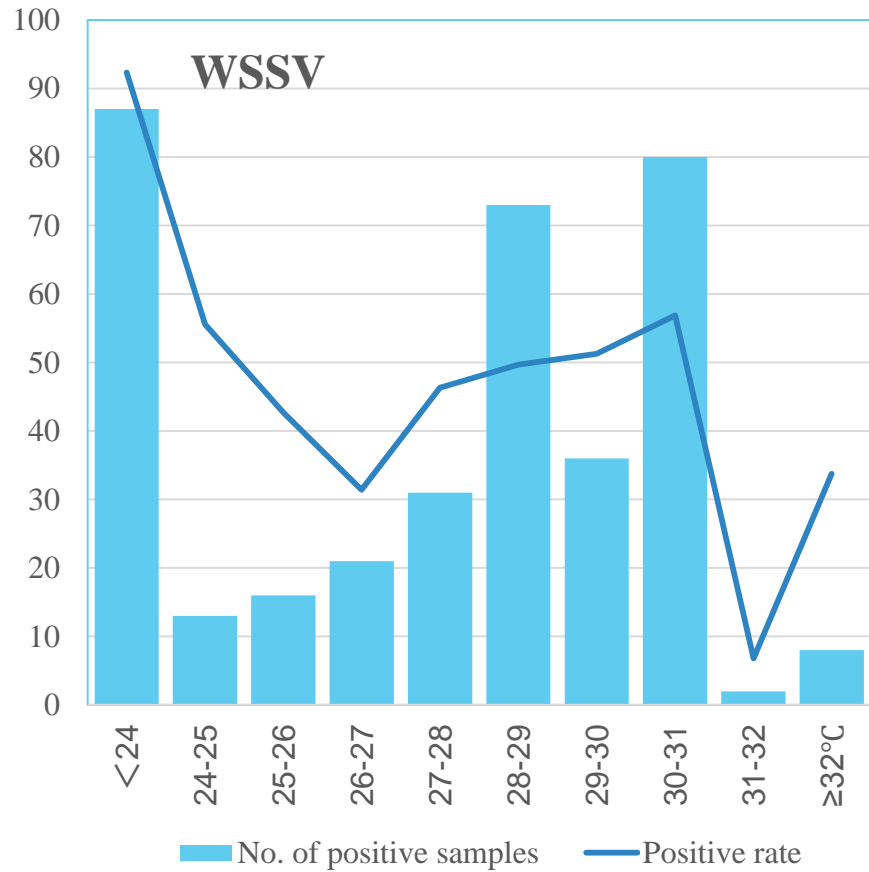
Positive rate of IHNV in China from 2015 to 2016

Results—host

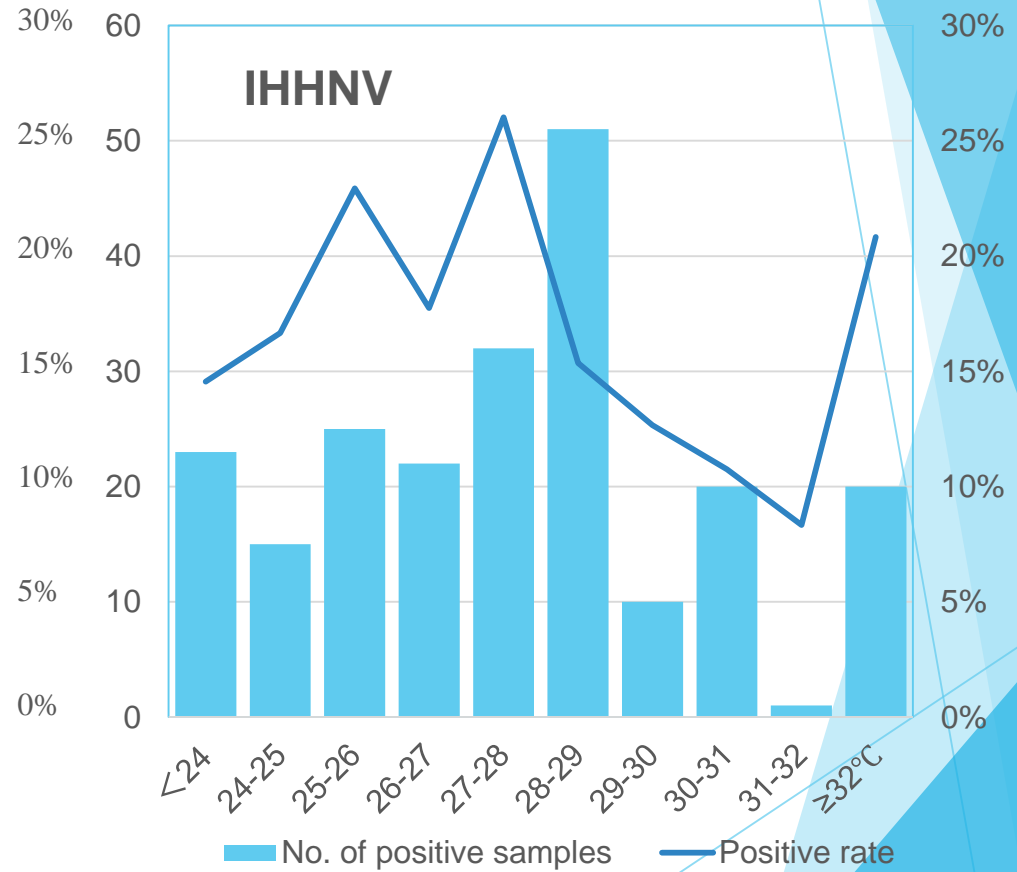
- ▶ WSSV: 11 species; IHNV: 4 species
- ▶ Positive rate of *L. vannamei* : WSSV=8.5% (n=997), IHNV=19.8% (n=761)



Results—temperature

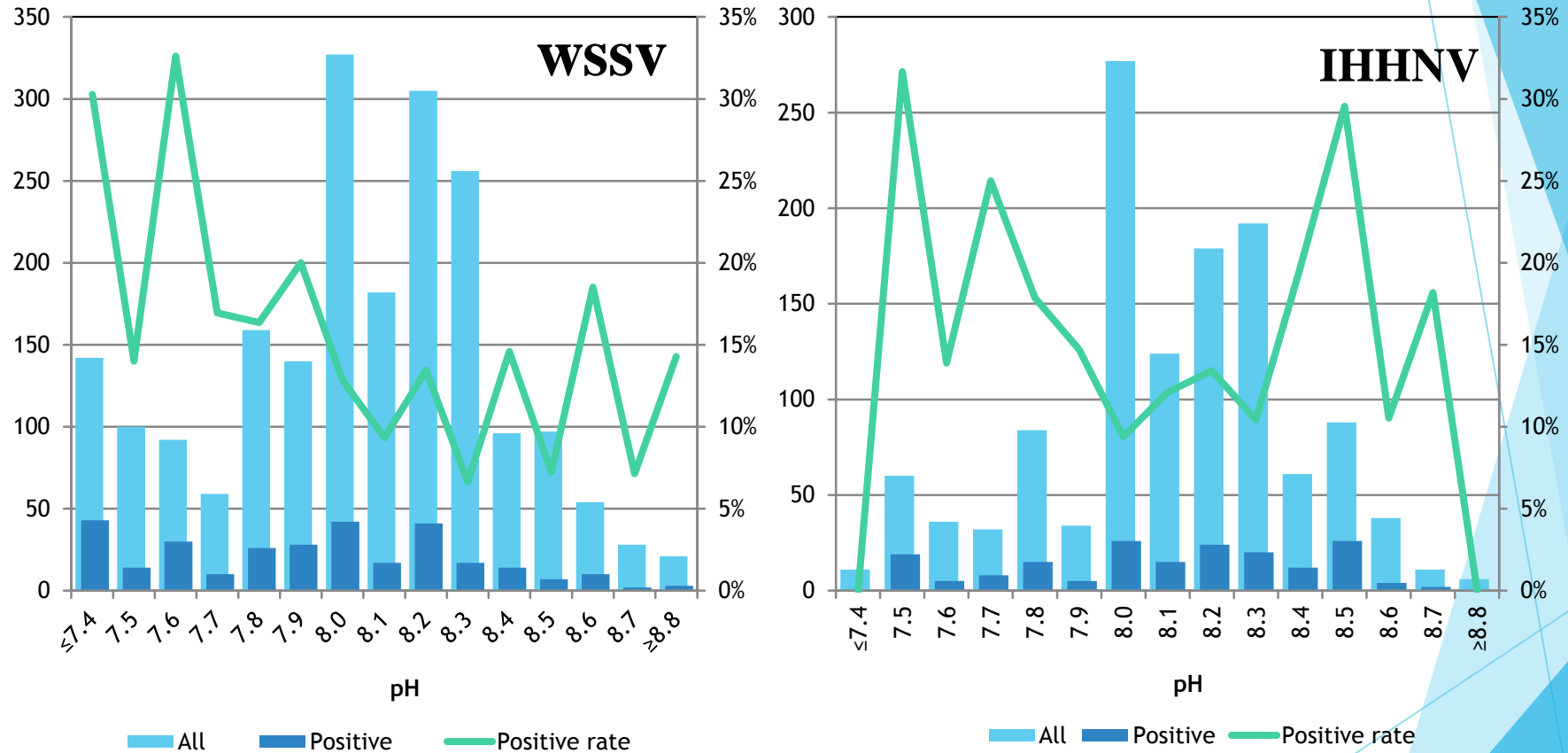


Positive samples and rate of different temperature for WSSV from 2007 to 2016



Positive samples and rate of different temperature for IHHNV from 2015 to 2016

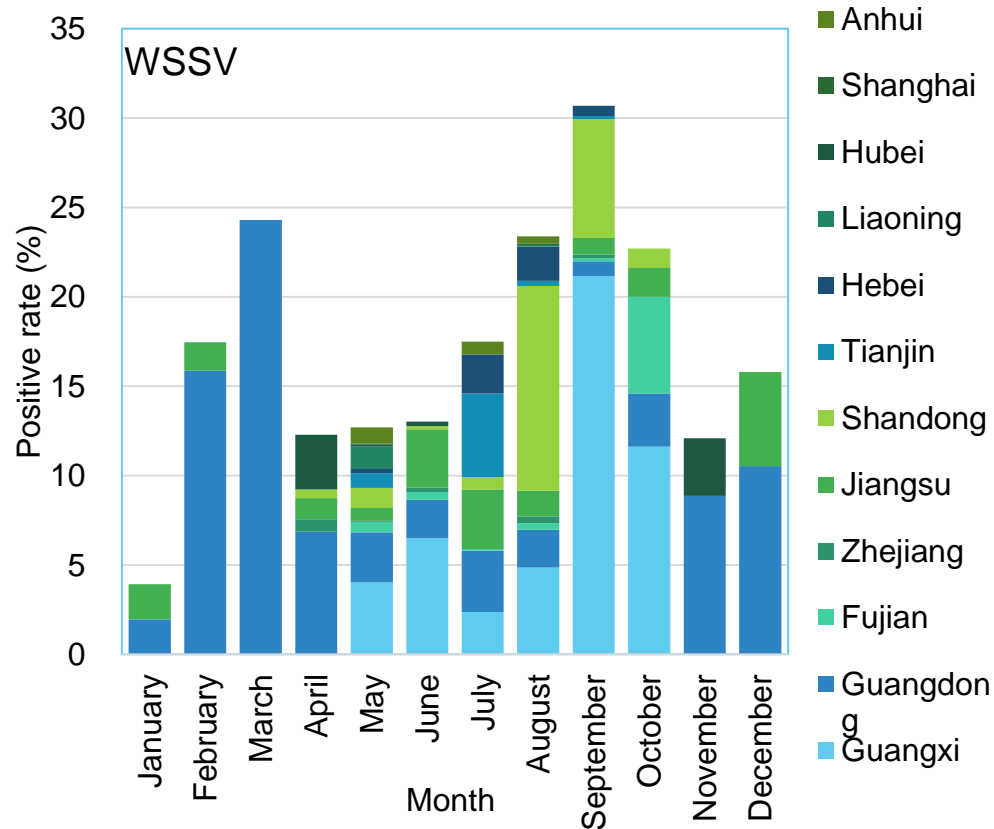
Results—pH



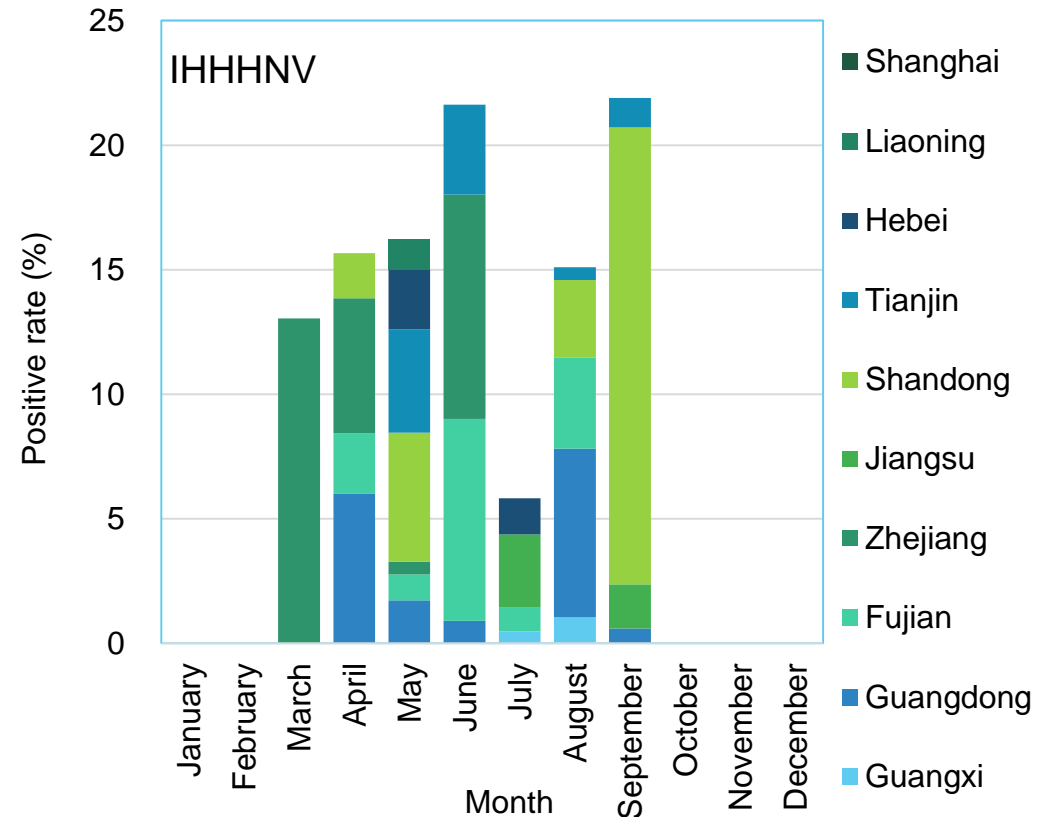
Positive samples and rate of different temperature for WSSV from 2007 to 2016

Positive samples and rate of different temperature for IHNV from 2015 to 2016

Result—month

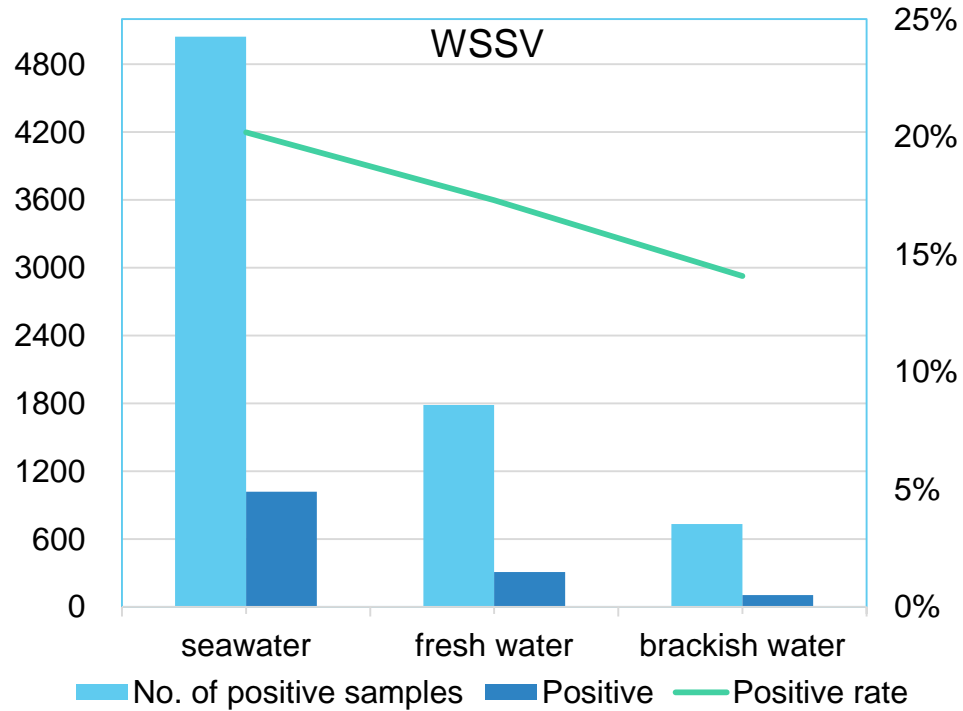


Positive rate of different months for WSSV from 2007 to 2016

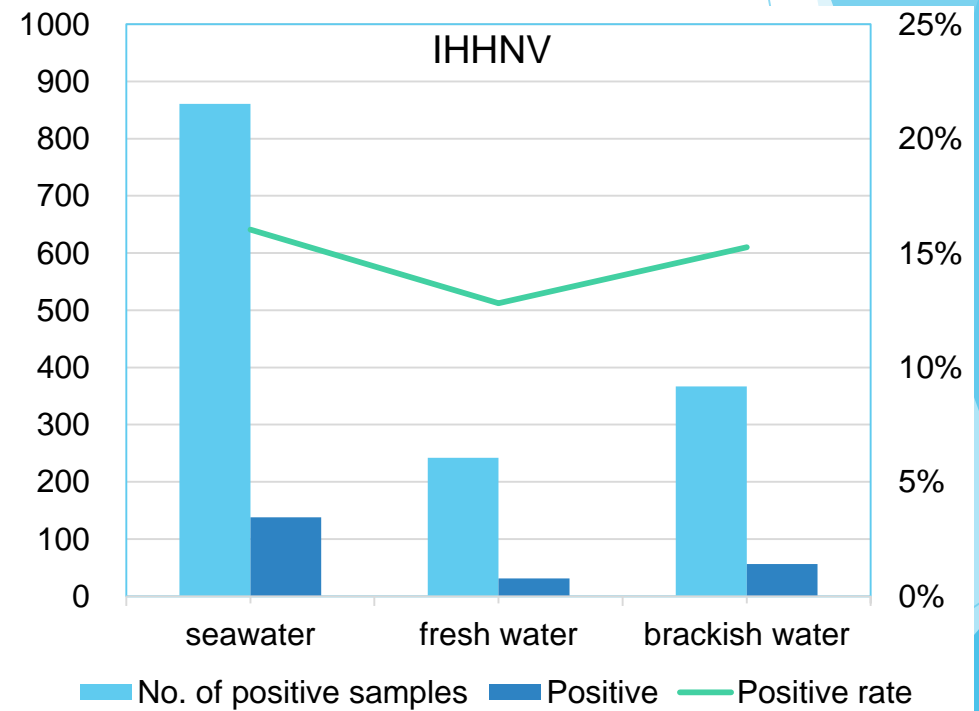


Positive rate of different months for IHNV from 2015 to 2016

Results—water environment

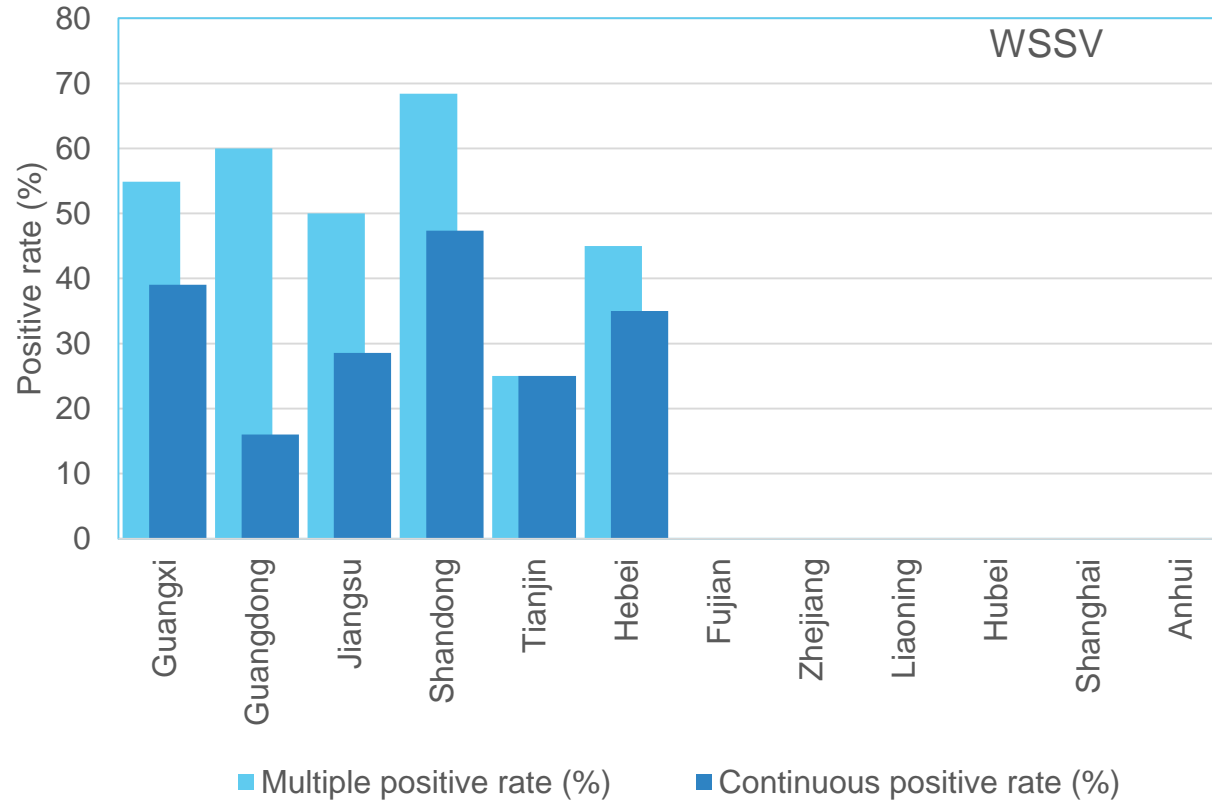


Positive rate of different kinds of water for WSSV from 2007 to 2016



Positive rate of different kinds of water for IHNV from 2015 to 2016

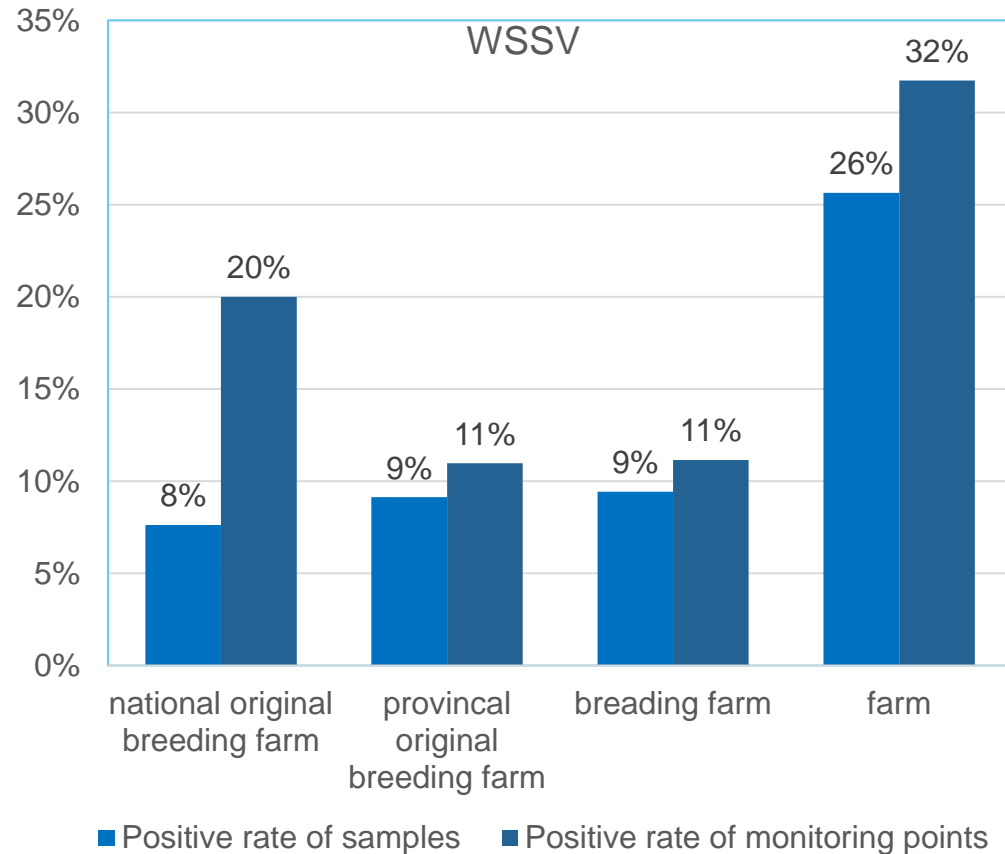
Results—positive monitoring points



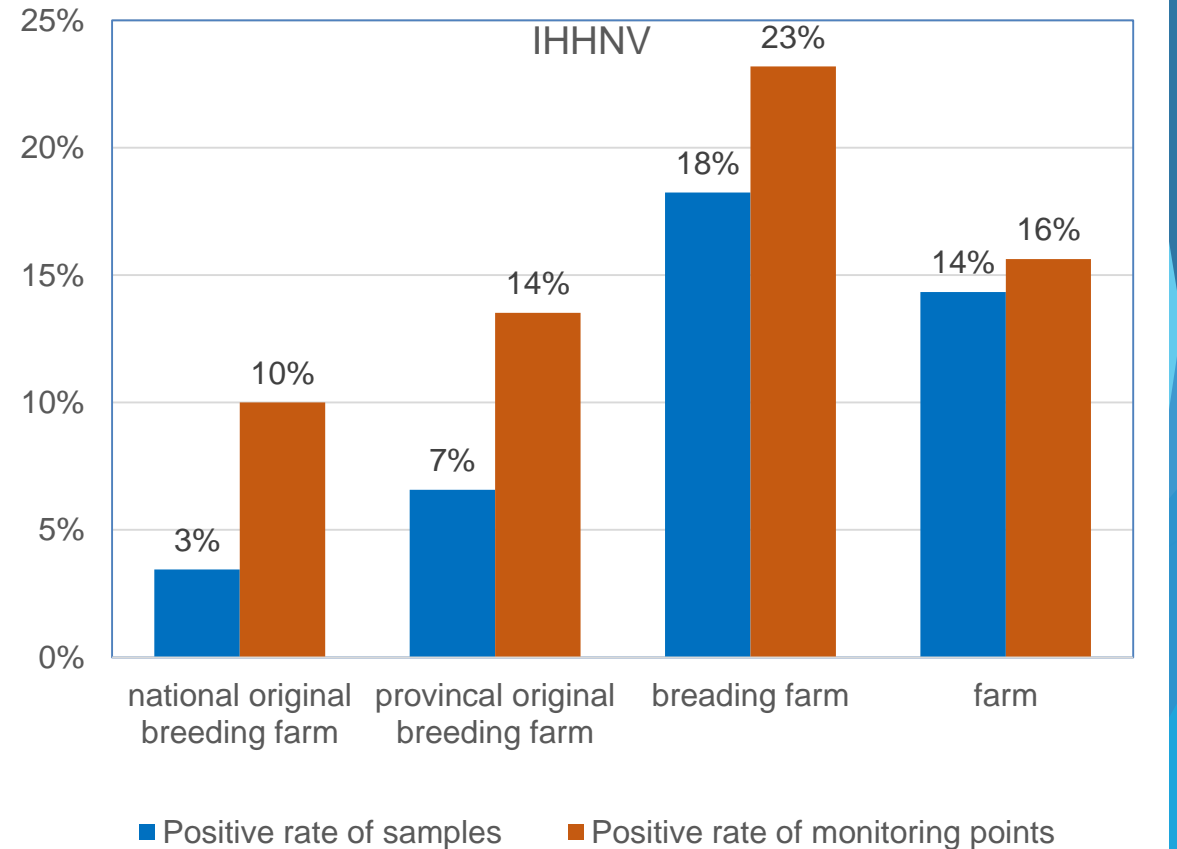
	Sum
Monitoring points	3500
Years for monitoring points	629
Continuous set as monitoring point	474
Positive monitoring points excluding the last year	166
Multiple positive monitoring points	90
Continuous positive monitoring points	57
Multiple positive rate (%)	54.2
Continuous positive rate (%)	34.3

Positive rate of monitoring points in the follow-up monitoring in the positive monitoring point of WSSV

Results—farm type



Positive rate of different kinds of farms for WSSV from 2007 to 2017



Positive rate of different kinds of farms for IHHNV from 2015 to 2016

Discussion

- ▶ Different degrees of WSSV infection have been found in crustacean farming areas in China.
- ▶ Positive rate of WSSV infection is decreasing after 2010.
- ▶ More positive rate of WSSV in farms which were positive for WSSV before.
- ▶ High positive rate for IHNV were detected in farms and breeding farms.
- ▶ WSSV will be widely available for a long period of time before the biosecurity system is established.

Analysis reports

Risk analysis and suggestions

- ▶ How and where the risk come from? Positive species, aquaculture model
- ▶ Recommendations on the national, provincial strategies for surveillance, prevention and control of the targeted disease.

Other Activities for AAH in China in 2016

- ▶ Working meetings
 - ▶ Summary workshop on National Surveillance for AAD
 - ▶ The Fourth Workshop of the First Commission of Experts for Aquatic Animal Disease Control
 - ▶ Expert Workshop for Establishment of Specific Disease Free Hatchery
- ▶ Training courses
 - ▶ Training course for aquatic animal monitoring, reporting and information communication for surveillance
 - ▶ Training course for laboratory diagnostic technology of Aquatic Animal Disease Control System
 - ▶ Training course of Official Veterinaries for Aquatic Animals
- ▶ Laboratory Proficiency Testing
 - ▶ 93 laboratories, 7 diseases, 90% satisfaction
- ▶ National Remote Diagnosis Network for Aquatic Animal Diseases
 - ▶ 1 national network platform with , 36 provincial platforms in 27 provinces, 2013 users
 - ▶ 5.3 million visits and 1113 expert diagnosis in 2016
- ▶ Surveillance on AMR of aquatic animal pathogenic bacteria
 - ▶ 12 provinces, 10 aquatic animals, 908 bacteria isolates, 15 antibiotics
- ▶ Standardization for aquatic animal disease control
- ▶ International cooperation
- ▶ Research programs

Thanks for attention!