

**2009/315.31**  
**People development program:**  
**Aquatic Animal Health Training**  
**Scheme: Introductory training**  
**workshop in surveillance for aquatic**  
**animal diseases**

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**Australian Government**

**Fisheries Research and  
Development Corporation**

**AusVet**  
Animal Health Services

**Project No. 2009/315.31**

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# Non Technical Summary

2009/315.31 People development program: Aquatic Animal Health Training Scheme -  
Introductory training workshop in surveillance for aquatic animal diseases

**PRINCIPAL INVESTIGATOR:** Dr E. Sergeant  
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## OBJECTIVES:

To train up to 25 aquatic animal health professionals in the planning and implementation of surveillance activities to achieve a variety of surveillance purposes.

## NON TECHNICAL SUMMARY:

Disease surveillance is an essential component of any aquaculture industry. Surveillance is required for early detection of new or introduced diseases, to demonstrate freedom from certain pathogens to support trade or to monitor and respond to changes in disease prevalence in a population.

Effective surveillance is also a critical element to support trade, particularly where disease status can be used as a non-tariff barrier to trade. Understanding the principles of surveillance program design and implementation will ensure that government agencies are equipped with high quality information to support claims to freedom from diseases of trade importance, where this is appropriate or necessary.

A training workshop on aquatic animal health surveillance was attended by 21 aquatic animal health professionals from various states and industry sectors. Topics covered include:

- an introduction to surveillance terminology and principles,
- classifying and describing surveillance activities,
- planning and reporting surveillance activities,
- sampling from populations,
- understanding and applying diagnostic tests,
- planning and analysis of surveillance for disease freedom,
- planning and analysis of surveillance for disease prevalence, including farm-level prevalence, and
- principles of risk-based surveillance for demonstrating disease freedom.

Participants actively contributed to discussions and activities and feedback indicated that they found the workshop beneficial and can apply what they learned in their normal work.

**KEYWORDS:** epidemiology, surveillance, freedom, prevalence, training, aquatic animal health.

## **Acknowledgments**

The assistance of Dr Kevin Ellard of Department of Primary Industries, Parks, Water and Environment, Tasmania, in provision of data for use in teaching examples and case studies is gratefully acknowledged.

## **Background**

Disease surveillance is an essential component of any aquaculture industry. Surveillance is required for early detection of new or introduced diseases, to demonstrate freedom from certain pathogens to support trade or to monitor and respond to changes in disease prevalence in a population.

However, surveillance is a specialised science and design of surveillance programs depends on the specific purpose of the surveillance and what it is expected to achieve. Inappropriate surveillance design risks either wasted resources (doing more than is necessary) or failure to achieve objectives due to poor design, inappropriate methods or inadequate sample size.

Effective surveillance is also a critical element to support trade, particularly where disease status can be used as a non-tariff barrier to trade. Understanding the principles of surveillance program design and implementation will ensure that government agencies are equipped with high quality information to support claims to freedom from diseases of trade importance, where this is appropriate or necessary.

This project will lead to improved knowledge and skills of aquatic animal health professionals in the design and implementation of aquatic animal health surveillance. This outcome will directly benefit the aquaculture and wild-caught fisheries industries through improved detection and management of disease occurrence. Consumers and the community will also benefit through improved reliability of supply and lower prices for products. The benefits of this project will be both private, to aquaculture and commercial fisheries through improved disease control, and public, to the consumer through assured supply of quality product at a competitive price.

## **Need**

Aquatic animal health advisors have a broad responsibility, including implementation of surveillance programs. This course will address that need by providing guidance on the design and implementation of surveillance programs for a variety of purposes and at both farm and industry level in aquatic animal industries. This will enable stakeholders and investors to have confidence that surveillance is meeting the desired objectives and supporting the industry in producing a safe and sustainable and disease free product for domestic and international markets.

## Objectives

1. To train up to 25 aquatic animal health professionals in the planning and implementation of surveillance activities to achieve a variety of surveillance purposes.

## Methods

Training resources for surveillance for aquatic animal health were developed. Topics covered include:

- an introduction to surveillance terminology and principles,
- classifying and describing surveillance activities,
- planning and reporting surveillance activities,
- sampling from populations,
- understanding and applying diagnostic tests,
- planning and analysis of surveillance for disease freedom,
- planning and analysis of surveillance for disease prevalence, including farm-level prevalence, and
- principles of risk-based surveillance for demonstrating disease freedom.

Resources developed include powerpoints, spreadsheet examples and several case studies using aquatic animal examples. Copies of existing (mainly terrestrial) manuals were also provided for participants. A course outline and teaching resources for a 3-day training workshop were developed. A one-off, 3-day training workshop was delivered in Melbourne in December 2014, to provide training to 21 participants from a variety of institutions and backgrounds (see Appendix).

Teaching was based on exercises and group learning activities and included an introduction to the freely available web-based epidemiological software, EpiTools (<http://epitools.ausvet.com.au>).

All materials developed for the training program are available to FRDC for use in the future, either by AusVet or other providers.

## Results/Discussion

A training workshop was held at Attwood Motel and Convention Centre, Melbourne on 2-4 December 2014. This workshop was attended by 21 aquatic animal health professionals from various states and industry sectors. The group was active and participated well in discussion and activities and appeared to be an appropriate target group for the training.

Participants were supplied with a USB thumb drive of electronic resources (available for FRDC). A list of participants is included in Appendix 3 and a revised course outline in Appendix 4. Feedback during the workshop was very positive and supported by on-line course evaluations at the end of the course, summarised in Appendix 5, additional details available at <https://www.surveymonkey.com/results/SM-FXJP2LQV/> (for a limited time).

Workshop resources were provided to participants on a memory stick and a zip file of the resources can be downloaded from <https://www.dropbox.com/s/jhpm35vrqwbozv1/Resources.zip?dl=0>.

In addition, EpiTools, which was used extensively for case studies, is freely available for use by anyone at <http://epitools.ausvet.com.au/content.php?page=home> and a zip version that can be downloaded and run off a memory stick is available at <http://epitools.ausvet.com.au/content.php?page=USB>.

## Benefits and adoption

Benefits from this activity will flow to all industry sectors through improved design, implementation and analysis of surveillance activities among veterinarians and consultants servicing the industry. Benefits could be consolidated by running follow-up courses for those unable to attend this time or as an advanced course for current participants.

## Further Development

Potential for further development of this course include:

- repeat the current course to try and further develop skills and knowledge in industry stakeholders unable to attend this time;
- prepare and deliver a more advanced course as a follow-up to consolidate learning and skills for those who have completed the introductory course.

## Planned outcomes

The primary outcome of this project is improved knowledge and skills of the aquatic animal health professionals who attended the workshop. This outcome will directly benefit the aquaculture and wild-caught fisheries industries through improved planning, design, implementation and analysis of aquatic animal health surveillance activities. Consumers and the community will also benefit through improved reliability of supply and lower prices for products. The benefits of this project will be both private, to aquaculture and commercial fisheries through improved disease surveillance and control, and public, to the consumer through assured supply of quality product at a competitive price. These benefits can be further extended by periodically repeating this course (and/or a follow-up advanced course) to consolidate and refresh knowledge across industry stakeholders and sectors.

## Conclusion

A training workshop on aquatic animal health surveillance was attended by 21 aquatic animal health professionals from various states and industry sectors. Participants actively contributed to discussions and activities and feedback indicated that they found the workshop beneficial and can apply what they learned in their normal work.

## Appendix 1: Intellectual Property

No new Intellectual property was generated for this project. Existing materials developed by AusVet Animal Health Services were revised and extended to make them suitable for the current audience.

## Appendix 2: Staff

This project was undertaken by Dr Evan Sergeant.

## Appendix 3: Participant list

<b>Surname</b>	<b>First name</b>	<b>Agency/Organisation</b>	<b>Location</b>	<b>State</b>
O'DELL	John	DPIPWE	Flinders Island	Tas
DAHLE	Kirk	NSW DPI Aquatic Biosecurity	Taylor Beach	NSW
RAMPANO	Ben	NSW DPI Aquatic Biosecurity	Nelson Bay	NSW
MOODY	Nick	CSIRO AAHL Fish Diseases Laboratory	Geelong	VIC
Brosnahan	Cara	Ministry for Primary Industries		NZ
FOYLE	Leo	James Cook University	Townsville	Qld
PIT	Josiah	Aquarium Industries	Epping	VIC
MARTINS	Camila	Southseas Abalone	Allestree	VIC
LUCAS	Dr Tim	Dept Agriculture, Fisheries & Forestry	Brisbane	Qld
Wortley	Steve	Dept of Agriculture	Canberra	ACT
Wronski	Eileen	Department of Primary Industries, Parks, Water and Environment	New Town	Tas
RUFF	Dr Nicole	Skretting Australia	Tasmania	Tas
EVANS	Olivia	Sydney University	Sydney	NSW
HOLMES	Lauren	PIRSA Fisheries & Aquaculture	Adelaide	SA
HUYNH	Dr Christine	Tassal Operations Pty Ltd	Hobart	Tas
SMITH	Daniel	Tassal Operations Pty Ltd	Hobart	Tas
De Poister	Brett	The Aquarium Vet	Moorabbin	VIC
MOONEY	Allan	Dept of Agriculture	Canberra	ACT
PHILLIP	Geogy	Dept of Agriculture	Canberra	ACT
LEE	Peter	Dept of Agriculture, Fisheries & Forestry (Qld)	Woorim	Qld
ERICKSON	Kevin	CQ University Australia	Gladstone	Qld



## Appendix 4: Revised course outline

Session times are 9.00am to 5.00pm each day, with breaks at (approximately) 10.30am, 12.30 and 3.00pm for morning tea, lunch and afternoon tea.

The course has a very practical focus and will be highly interactive. Basic surveillance concepts will be introduced through presentations and discussion and will be reinforced by practical examples, exercises and group activities. Finally, a series of case studies will be used to provide participants with the opportunity to apply the skills and concepts to real-world examples.

Session	Topic	Content
Day 1	Introduction(s) Workshop approach & objectives Housekeeping, etc	
1 – 2	Introduction to surveillance	<ul style="list-style-type: none"><li>• What is surveillance?</li><li>• Who does surveillance?</li><li>• Why do surveillance?</li><li>• Types of surveillance</li><li>• Population coverage</li></ul>
3	Planning a surveillance activity	<ul style="list-style-type: none"><li>• Surveillance for different purposes</li><li>• Determining appropriate surveillance methods</li><li>• Critical elements of a surveillance plan</li><li>• Plan and implement an epidemiological study</li><li>• Reporting a surveillance activities</li></ul>
4	Sampling populations	<ul style="list-style-type: none"><li>• Sampling methods – random vs non-random</li><li>• Sample size calculation</li><li>• Sampling examples</li></ul>
Day 2		
5 – 6	Diagnosis and screening	<ul style="list-style-type: none"><li>• Methods to diagnose disease</li><li>• Difference between diagnosis and screening</li><li>• Precision, sensitivity and specificity</li><li>• Interpret test results for disease diagnosis and screening – positive and negative predictive values</li><li>• Farm-level sensitivity and specificity</li><li>• True and apparent prevalence</li></ul>
9 – 10	Surveillance for presence/absence of disease (freedom)	<ul style="list-style-type: none"><li>• Application of 1-stage &amp; 2-stage sampling for freedom</li></ul>

		<ul style="list-style-type: none"> <li>• Sample size</li> <li>• Sample selection</li> <li>• Analysis of data</li> <li>• Updating confidence over time</li> <li>• Combining data sources</li> <li>• practical exercises/case studies</li> </ul>
Day 3		
9	Surveillance for presence/absence of disease	<ul style="list-style-type: none"> <li>• Continued</li> </ul>
10	Surveillance to measure disease prevalence	<ul style="list-style-type: none"> <li>• Application of 1-stage &amp; 2-stage sampling for prevalence estimation</li> <li>• Sample size</li> <li>• Sample selection</li> <li>• Analysis of prevalence data</li> </ul>
11 – 12	Risk-based surveillance for disease freedom	<ul style="list-style-type: none"> <li>• Risk-based sampling for demonstrating disease freedom</li> <li>• Adjustment for differential risk</li> <li>• Scenario-tree models for complex systems</li> <li>• practical exercises/case studies</li> </ul>
	Workshop evaluation and close	

## **Appendix 5: Course evaluation summary**

# Introduction to Aquatic Animal Health Surveillance

Question Summaries

Individual Responses

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13 responses

12 days (December 02, 2014 - now)

7 views

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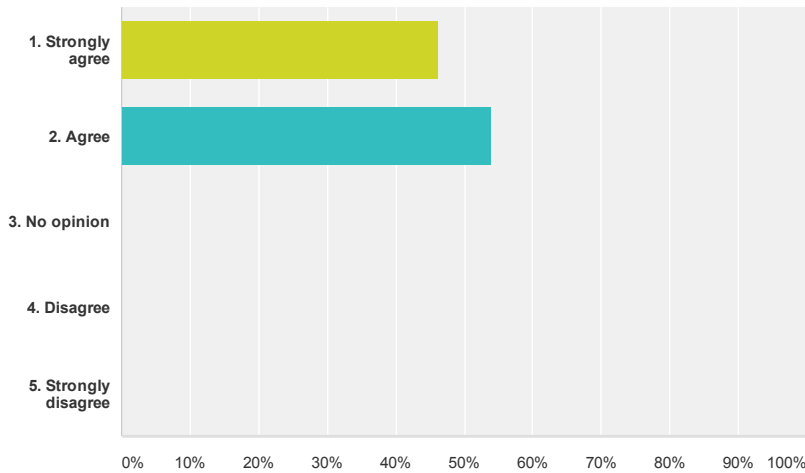
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Q1

## The course presentations had an appropriate level of detail:

Answered: 13 Skipped: 0

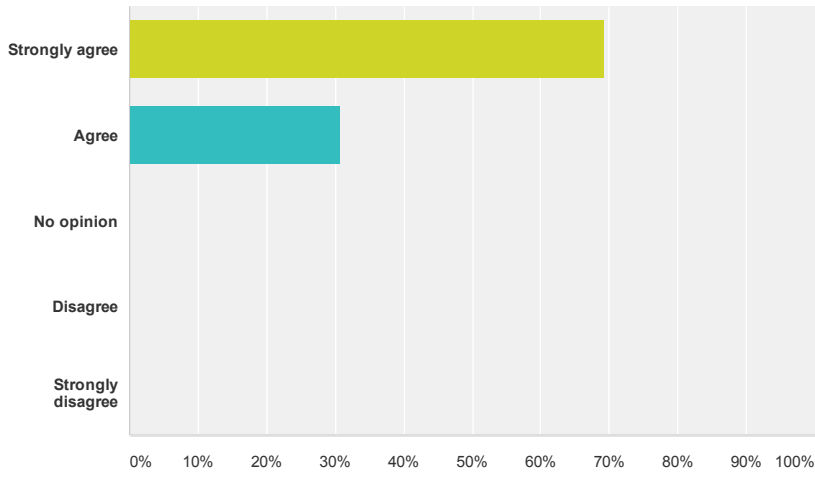


Answer Choices	Responses
1. Strongly agree	46.15% 6
2. Agree	53.85% 7
3. No opinion	0.00% 0
4. Disagree	0.00% 0
5. Strongly disagree	0.00% 0
Total	13
<a href="#">Comments (1)</a>	

Q2

## The class exercises and materials provided were useful:

Answered: 13 Skipped: 0



Answer Choices	Responses
<b>Strongly agree</b>	<b>69.23%</b> 9
<b>Agree</b>	<b>30.77%</b> 4
<b>No opinion</b>	<b>0.00%</b> 0
<b>Disagree</b>	<b>0.00%</b> 0
<b>Strongly disagree</b>	<b>0.00%</b> 0

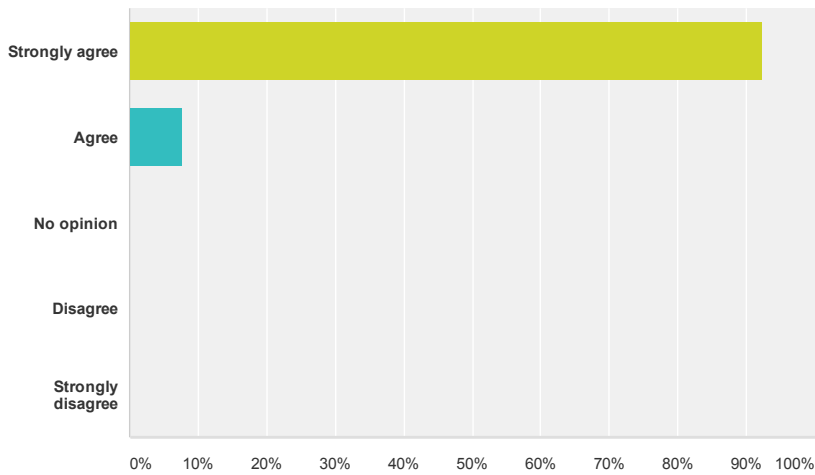
Total Respondents: 13

[Comments \(2\)](#)

**Q3**

**I was given opportunities to ask questions and discuss topics:**

Answered: 13 Skipped: 0



Answer Choices	Responses
<b>Strongly agree</b>	<b>92.31%</b> 12
<b>Agree</b>	<b>7.69%</b> 1
<b>No opinion</b>	<b>0.00%</b> 0
<b>Disagree</b>	<b>0.00%</b> 0
<b>Strongly disagree</b>	<b>0.00%</b> 0

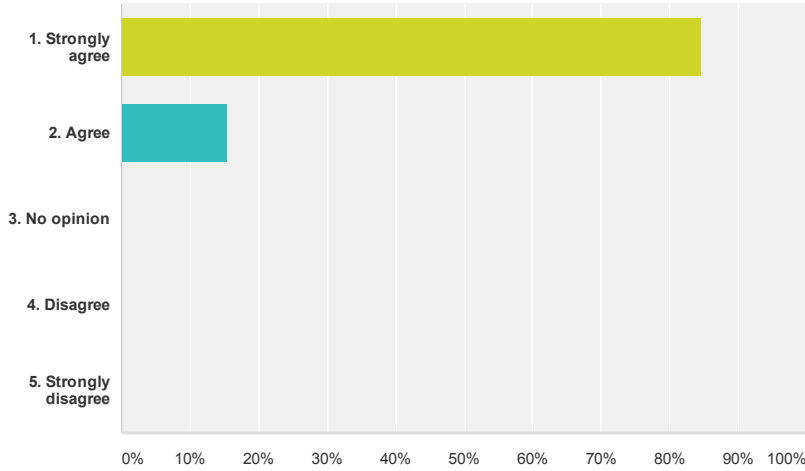
Total Respondents: 13

[Comments \(0\)](#)

**Q4**

### The presenter was knowledgeable on the subject matter:

Answered: 13 Skipped: 0

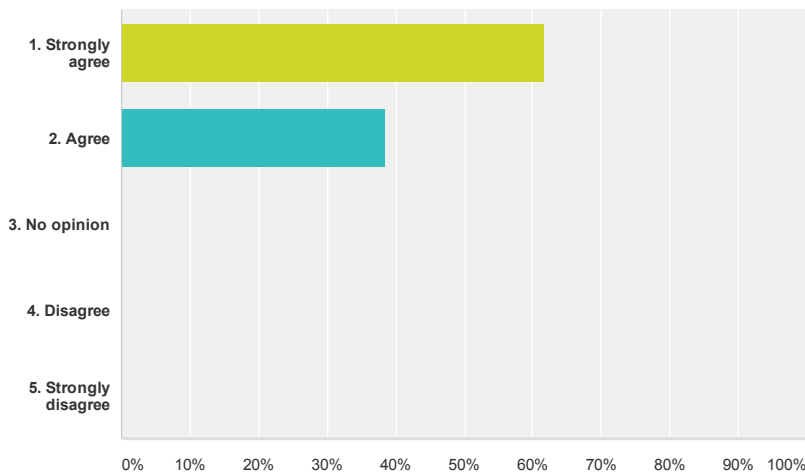


Answer Choices	Responses
1. Strongly agree	84.62% 11
2. Agree	15.38% 2
3. No opinion	0.00% 0
4. Disagree	0.00% 0
5. Strongly disagree	0.00% 0
Total	13
Comments (0)	

Q5

### The concepts were adequately explained by the presenter (e.g. suitable examples were provided to illustrate key points):

Answered: 13 Skipped: 0



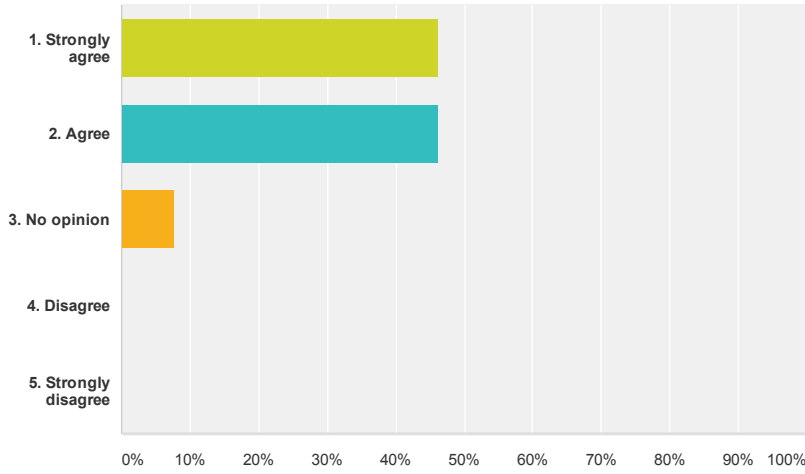
Answer Choices	Responses
1. Strongly agree	61.54% 8
2. Agree	38.46% 5
3. No opinion	0.00% 0
4. Disagree	0.00% 0
5. Strongly disagree	0.00% 0
Total	13

Comments (0)

Q6

### I will be able to apply what I have learnt in my job:

Answered: 13 Skipped: 0

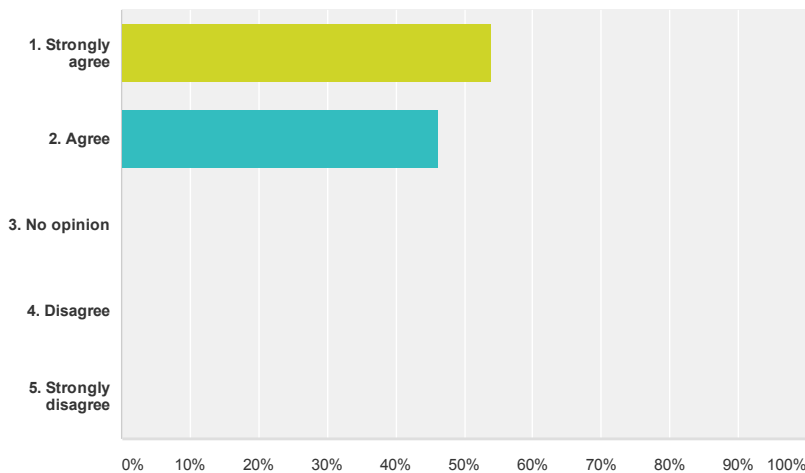


Answer Choices	Responses
1. Strongly agree	46.15% 6
2. Agree	46.15% 6
3. No opinion	7.69% 1
4. Disagree	0.00% 0
5. Strongly disagree	0.00% 0
Total	13
Comments (0)	

Q7

### The workshop met my expectations:

Answered: 13 Skipped: 0



Answer Choices	Responses
1. Strongly agree	53.85% 7
2. Agree	46.15% 6
3. No opinion	0.00% 0

4. Disagree	0.00%	0
5. Strongly disagree	0.00%	0
Total		13
Comments (0)		

Q8

### What did you find most rewarding about the workshop?

Answered: 11 Skipped: 2

I found the examples discussed useful as a way of illustrating the concepts discussed in the material (ie. in terms of calculating sample sizes, etc)/ It was also excellent to meet / discuss ideas with other participants in the workshop coming from different areas. Overall I think the coursed was very useful in terms of an intro to sampling and surveillance - that will require more delving into when it comes to applying the concepts on to the farm sites

12/12/2014 9:49 AM

Simply covering material but getting nuances explained - stuff that is either missing from text books, or is glossed over when reading text books.

12/12/2014 9:29 AM

Real world examples

12/11/2014 5:17 PM

The presenter, the material and the fellow attendants but not in any particular order....the food was ok too.

12/9/2014 5:32 PM

practical examples of how to design surveillance strategies and how to deal with data. Particularly for demonstrating freedom

12/8/2014 5:15 PM

Q9

### What did you find least rewarding about the workshop?

Answered: 9 Skipped: 4

Probably a bit of discussion about some of the background behind the methods of calculation of the various measures. Interesting to know, but in a short course can be too much to think about perhaps (esp. with different backgrounds of attendee's - you may lose some people)

12/12/2014 9:49 AM

The nature of any workshop limits the amount of time details can be explained and re-explained...not specific to this workshop; a general comment about workshops.

12/12/2014 9:29 AM

The distance needed to travel to attend.

12/11/2014 5:17 PM

my lack of fore knowledge

12/9/2014 5:32 PM

Probably don't need as much on prevalence

12/8/2014 5:15 PM

limited (1 only) group discussion exercises

12/8/2014 9:24 AM

Q10

### What suggestions do you have for future workshops? Please list any other topics that you would like to understand better:

Answered: 9 Skipped: 4



Perhaps a little more time on the basics - as these are used more and more in the latter stages of the course. Hard to say as everyone's background is different - but an attendee with little epi experience might struggle to follow!

12/12/2014 9:49 AM

None. Once the workshop is targeted at the appropriate audience, it is well done. Getting the targeting (pitching) right for everyone is not possible. How appropriate the pitch? Like an unknown prevalence...a educated guesstimate!

12/12/2014 9:29 AM

Start on a Monday or Wed, so that the entire week is not used for the 3 day workshop.

12/11/2014 5:17 PM

OIE requirements

12/8/2014 5:15 PM

A venue closer to the city to better facilitate social interactions

12/8/2014 9:24 AM

Keep up the step by step breakdowns they are really helpful to understanding the key concepts.

12/5/2014 11:12 AM

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