

OMAFRA-UoG Emergency Management Research Expo December 7, 2012

Veterinary Diagnostic Laboratory Emergency Preparedness

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UNIVERSITY
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MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS



Agenda

1. Background: Emergency Preparedness in a Laboratory Setting

2. Part I: Laboratory Emergency Management Survey

3. Part II: Laboratory Emergency Management Financial Template

4. References & Acknowledgements



Emergency Preparedness – FAD Response





Canadian Animal Health Surveillance Network

CAHSN established ~ 2006

- ❖ Network of federal, provincial and university animal health diagnostic labs
- ❖ Linked to Canadian Public Health Lab Network
- ❖ Key outputs of CAHSN:
 - Surveillance and early warning system for animal disease threats
 - Rapid diagnosis in regional lab, confirmed by central reference lab
 - Surge capacity to provide a rapid response and post-outbreak recovery surveillance testing

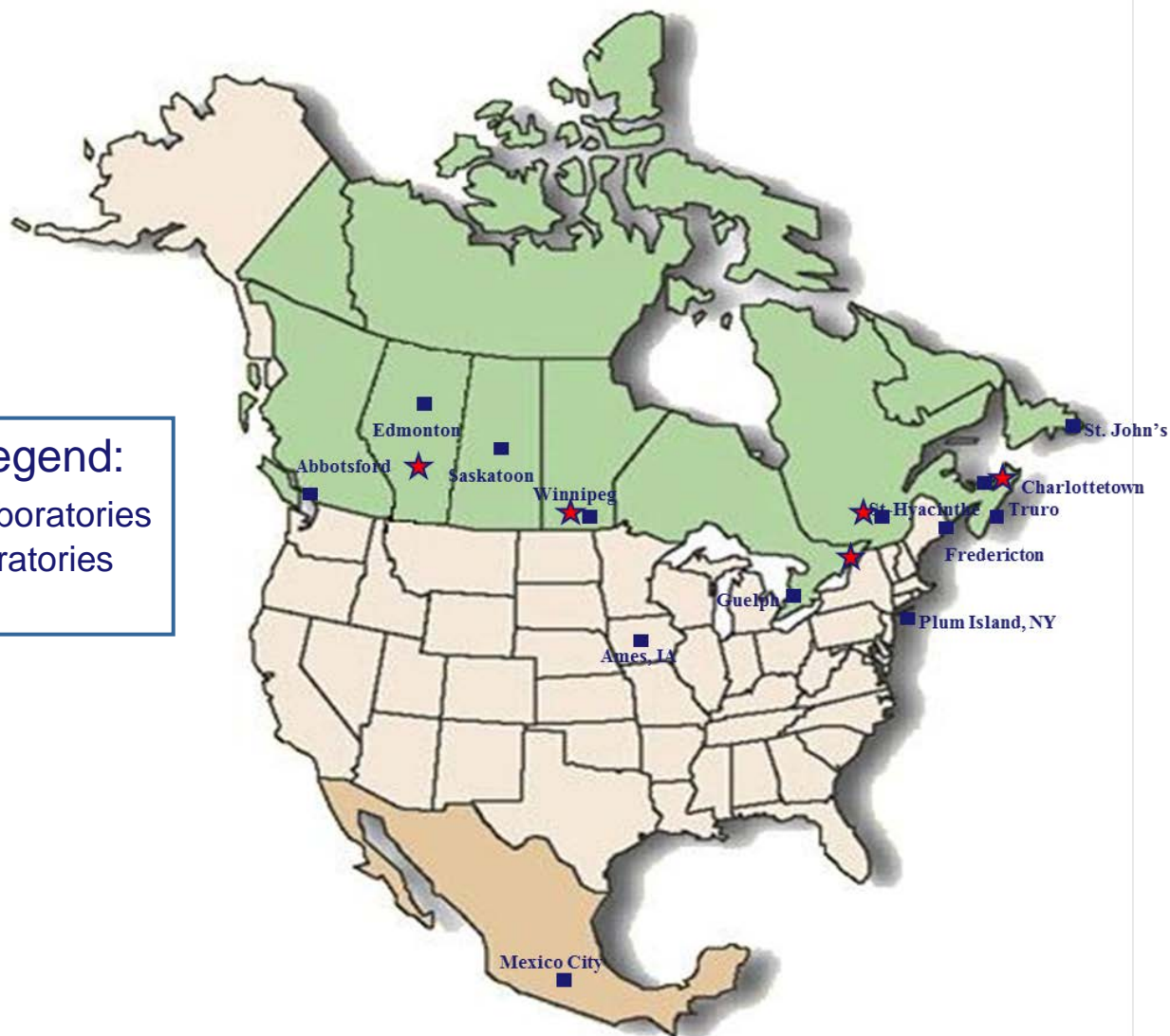
<http://www.inspection.gc.ca/english/anima/surv/cahsnrsize.shtml>



CAHSN Laboratories

CAHSN Legend:

- Partner Laboratories
- ★ CFIA Laboratories





Laboratory Emergency Management Survey

Survey Objectives:

- ❖ Investigate and provide a benchmark of the current emergency preparedness status of CAHSN university and provincial labs
- ❖ Generate a checklist that can be used to assist in developing a lab emergency response plan



Laboratory Emergency Management Survey

- ❖ Survey questions based upon guidelines developed by the Emergency Preparedness Workgroup of the American Association of Veterinary Laboratory Diagnosticians (AAVLD, 2003)
- ❖ 52 questions, LimeSurvey electronic format
- ❖ Invited participants were the 10 provincial/university labs most likely to be responding to FAD outbreak (CAHSN)



Survey Design: Questions

A) General Operations

- ❖ Financial: funding agencies, revenue sources
- ❖ QA accreditation, containment facilities
- ❖ Staffing
- ❖ Test disciplines
- ❖ Lab Information Management System (LIMS)
- ❖ Surveillance reports
- ❖ Lab access
- ❖ Standard Operating Procedures



Survey Design: Questions

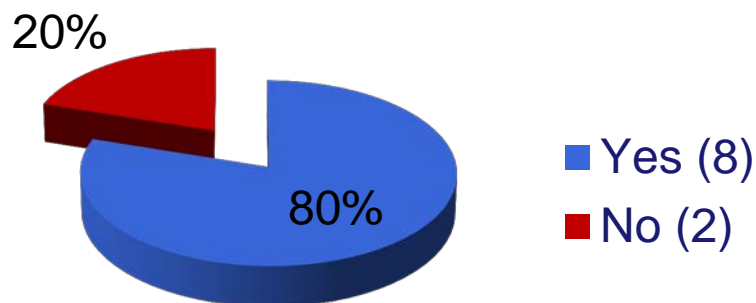
B) Emergency Management

- ❖ Lab Emergency Response Plan (FADES)
- ❖ Emergency funding
- ❖ Training: CAHSN, FAD, ICS
- ❖ Surge capacity: staff, supplies, tests (PCR, ELISA)
- ❖ Business continuity plan
- ❖ FAD test exercises
- ❖ What does the lab need to be ready for a FAD?

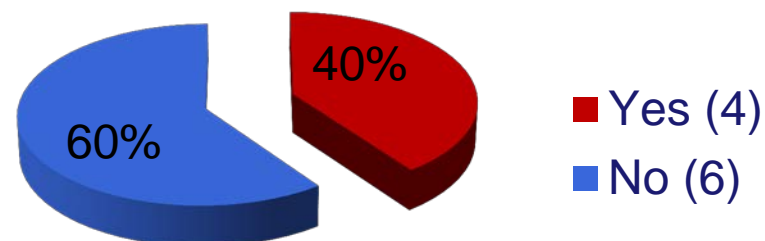


Emergency Response Plans

Does the lab have an emergency response plan?



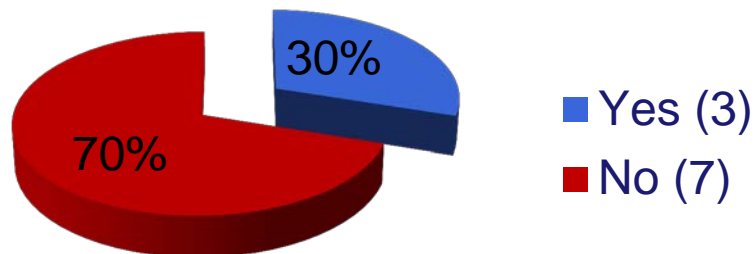
Has the lab identified funding sources to pay for staff and consumables during an emergency?



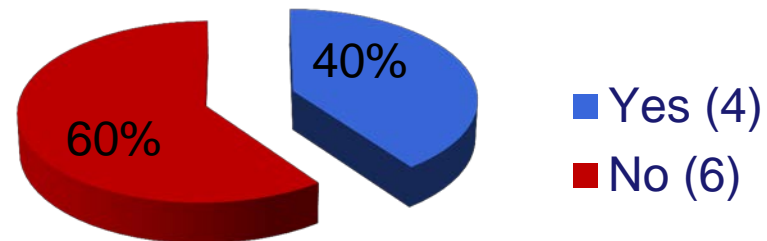


Surge Testing Demands

Have standing purchase orders been negotiated with major suppliers to permit rapid delivery of essential consumables and reagents?



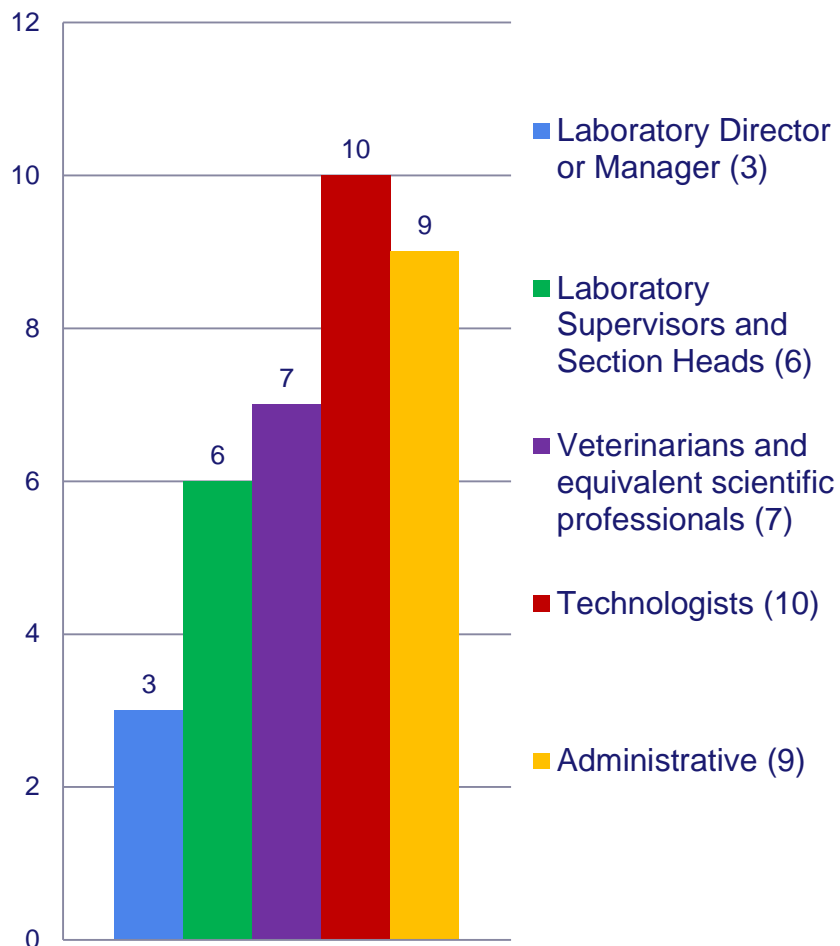
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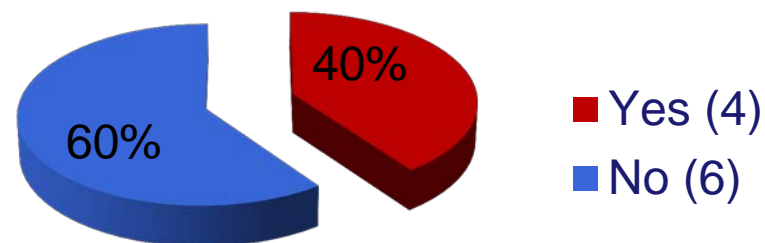


Human Resources

Unionized Staff Categories



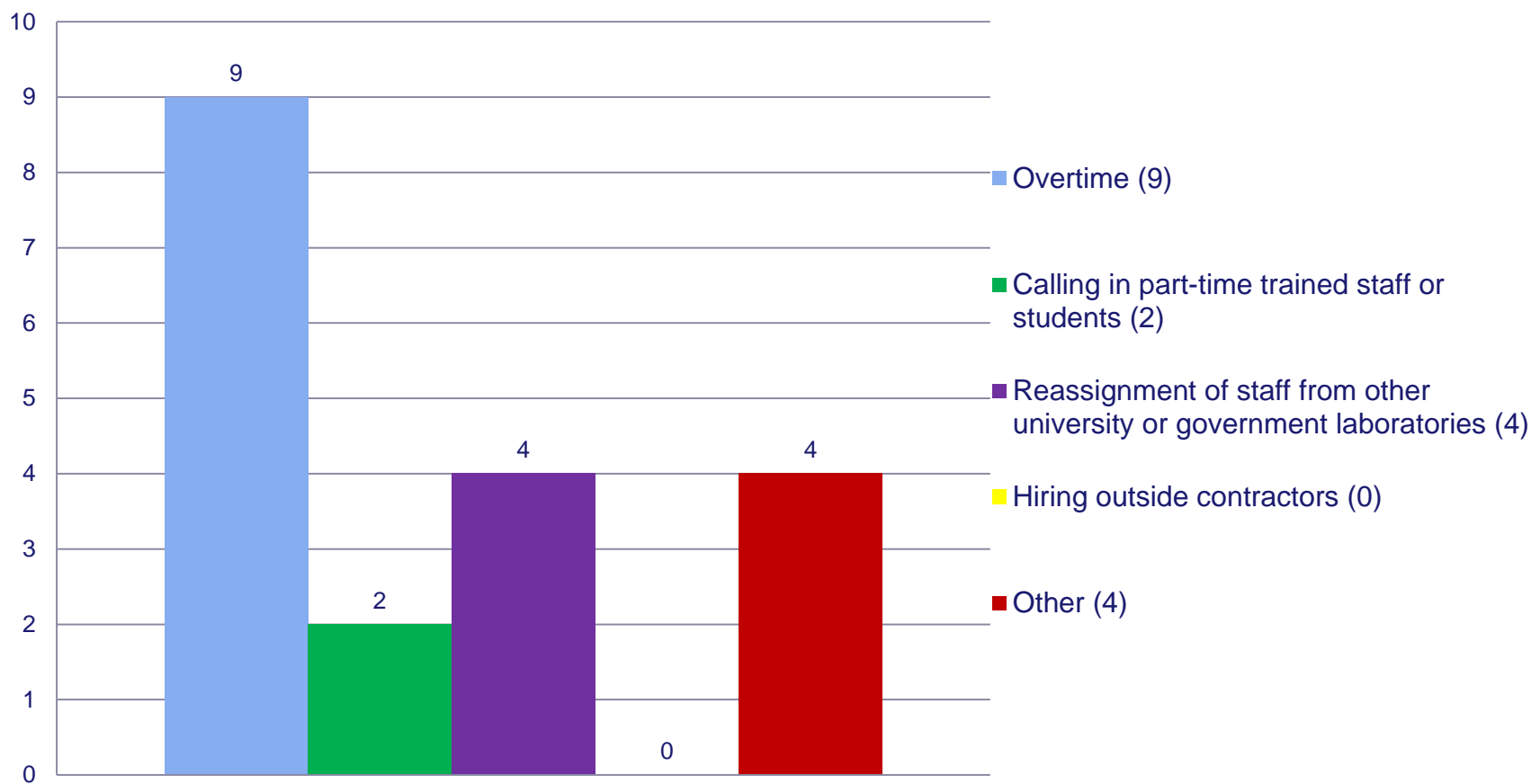
Pre-existing labour agreements to permit overtime, reassignment or hiring of contractors during an emergency?





Human Resources – Surge Capacity

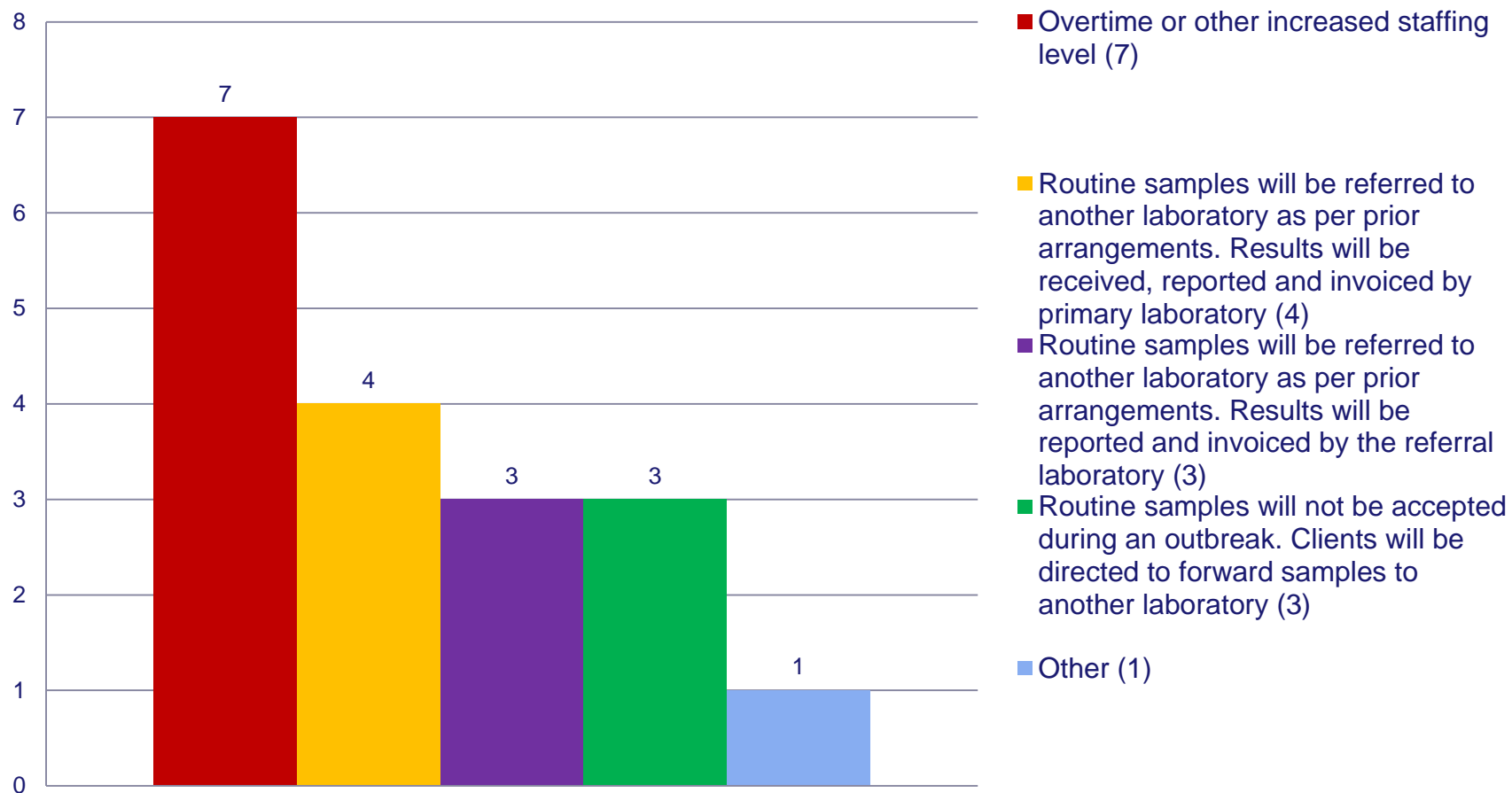
How would the lab manage surge testing demand during an outbreak?





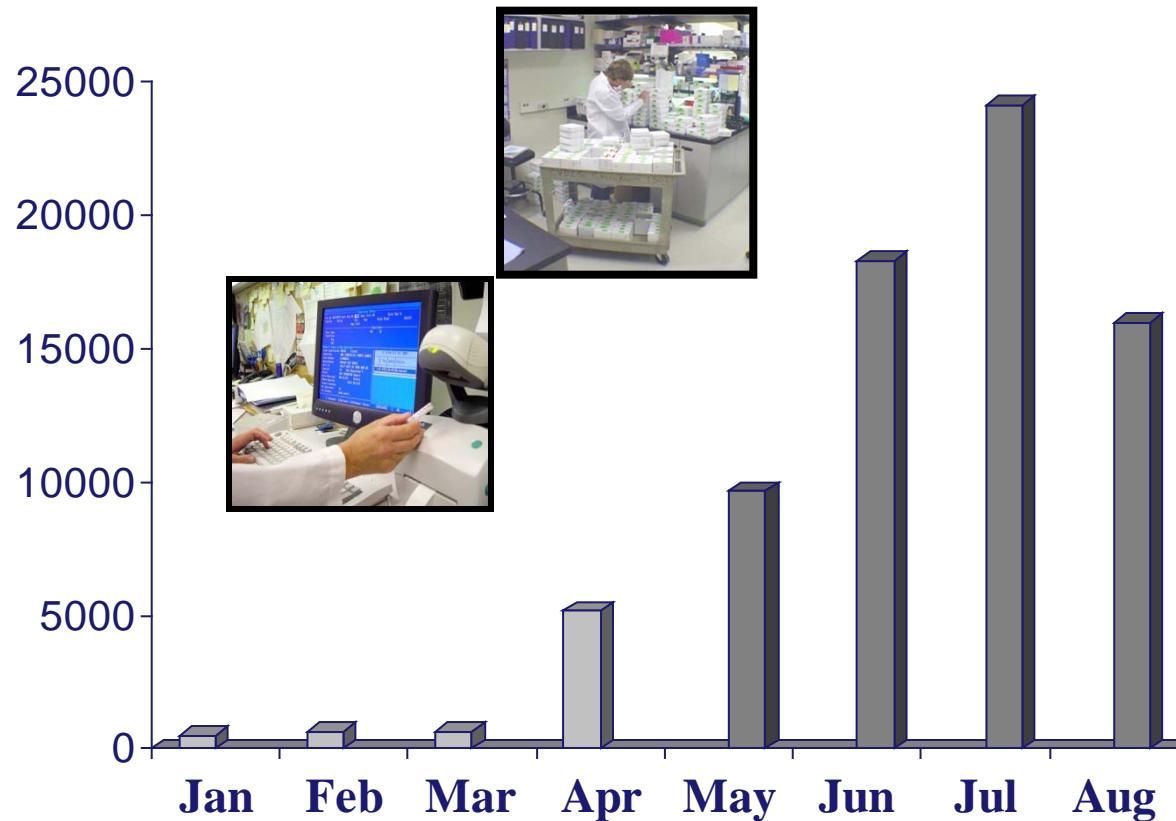
Human Resources – Business Continuity

How would the lab manage business continuity (routine testing) during an outbreak?





California 2002-03 Exotic New Castle Outbreak: Surge Testing Demand



Dr. Grant Maxie



Survey Summary: Successful Preparations for FAD Emergency

- ❖ CAHSN has accelerated the training, certification and equipping of partner labs to meet the demand for surge testing
- ❖ >70% of labs have:
 - ❖ Lab Emergency Response Plan
 - ❖ Biosafety Officer, containment level 2+ (FAD)
 - ❖ QA Officer, SOPs (sample tracking, disinfection)
 - ❖ Technical analysts certified for PCR and ELISA FAD tests



Survey Summary: Challenges & Opportunities for Enhanced Preparedness

- ❖ Human resources management (labour relations, staffing needs, overtime)
- ❖ Financial planning – who pays the bills?
- ❖ Suppliers
- ❖ Business continuity planning – managing routine diagnostic cases during the outbreak
- ❖ Advanced training needs: ICS, FAD lab exercises



Lab Emergency Management Survey



- ❖ Survey results presented at the 9th annual meeting of the Canadian Animal Health Laboratorians Network, Calgary, AB
- ❖ Survey results and Lab Emergency Management Checklist provided to participating CAHSN Lab Directors



Laboratory Emergency Management Checklist

- ☐ A. Laboratory Emergency Management Plan
- ☐ B. Laboratory Certification/Accreditation
- ☐ C. Personnel
- ☐ D. Biosafety
- ☐ E. Laboratory Biosecurity
- ☐ F. Laboratory Information Management System (LIMS)
- ☐ G. Laboratory Standard Operating Procedures
- ☐ H. Emergency Contact Lists
- ☐ I. Supplies
- ☐ J. Financial
- ☐ K. Business Continuity Plan
- ☐ L. Foreign Animal Diseases Exercises



Template: Main Menu

**UNIVERSITY
of GUELPH**
LABORATORY SERVICES
Animal Health Laboratory

Veterinary Diagnostic Lab Financial Template

Product: Veterinary Diagnostic Lab Financial Template
Designer: Kevin McLeod
Company: Animal Health Laboratory, University of Guelph
Email: kmcleod@uoguelph.ca; mspinato@uoguelph.ca

Objective: Assist Veterinary Labs in Emergency Planning
File Name: Veterinary Lab Diagnostic Template Version 2.2
BETA Ready.xls
Version: v2.2 15-Nov-2012
Audit Status: **Completed Draft**
Units (Currency): **Canadian Dollar (CAD)**

Reset

Select:

Main Menu
Management_Summary
Emergency_Management_Plan
Surge_Capacity
Business_Continuity_Plan
Standard_Formats_Map

Background

CAHSN

Survey

Checklist

**Financial
Template**



Financial Template Overview

Mgmt. Summary

- Consolidate all relevant outputs in one place
- Quick, easy access to important info.
- User-friendly

Emergency Mgmt. Plan

- Costs related to emergency preparedness
- User can choose which costs to consider

Surge Capacity

- Designed to gauge lab's capacity for PCR/ELISA
- Allows user to gauge impact on capacity in emergency
- Basic cost calculation for FAD testing

Business Continuity

- User determines business strategy in emergency
- Determines impact to lab under reduced routine capacity



Emergency Mgmt. Plan: Personnel

Personnel Training	
<input type="checkbox"/> Include CAHSN Training Costs	
Real/In-Kind Cost	<input type="text"/>
<input type="checkbox"/> Include CFIA-FAD Recognition Training Costs	
Real/In-Kind Cost	<input type="text"/>
<input type="checkbox"/> Include Incident Command System (ICS) Training Costs	
Real/In-Kind Cost	<input type="text"/>
<input type="checkbox"/> Include Media Training Costs	
Media Training Cost	<input type="text"/>
Total Costs for Personnel Training	<input type="text" value="\$0.00"/>



Surge Capacity: PCR Tests

PCR Test Capacity

Average Daily Number of PCR Test Batches (Normal Operation):

Average Number of PCR Tests per Batch (Normal Operation):

Average Daily Technician Staffing Level for Routine PCR Testing

Average Routine PCR Test Daily Capacity at Staff Level of: 6

6
400
6
2400

Planned Level of FAD PCR Testing (Daily):

Planned Level of PCR Routine Testing (Daily):

Daily PCR Testing Maximum Capacity:

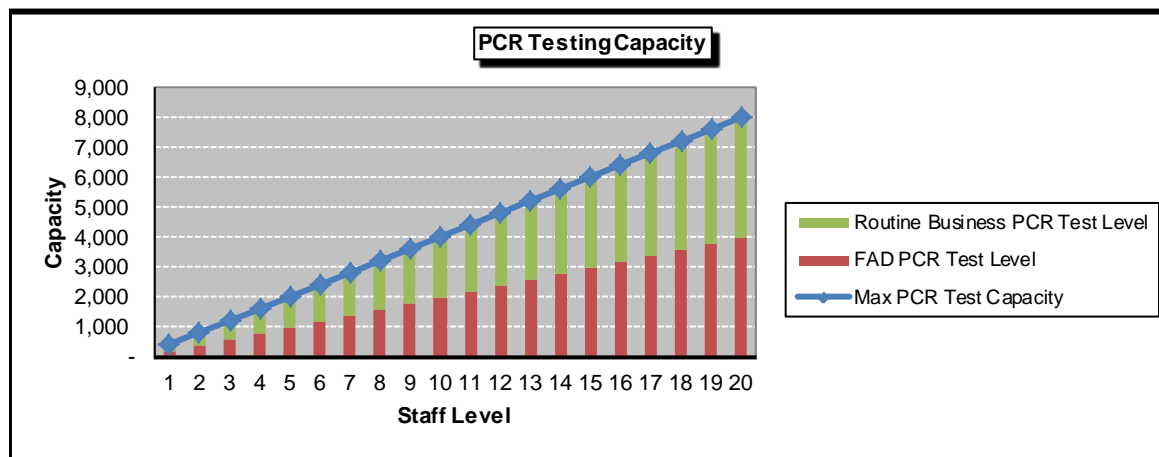
Planned Level of PCR Business Continuity (%):

500
2000
2500
83%

Sensitivity Analysis: PCR Test Capacity

Select a Level of FAD Testing (% of Maximum Capacity):

50%





Surge Capacity: PCR FAD Cost

PCR Testing Levels During a FAD

☐ Normal Operating Capacity

☒ Move to Surge Capacity Level of: 2500 per 24 Hours

FAD: PCR Testing Cost

Number (#) of Technicians (Regular Salary):	5
Regular Technician Daily Cost per Employee:	\$150.00
Total Regular Staff Daily Cost	\$750
Number (#) of Technicians (Overtime):	5
Technician Overtime Daily Cost per Employee:	\$150.00
Total Overtime Staff Daily Cost	\$750
Non-Routine Staff Costs (Training, etc.) per Day:	\$200
Administration & Miscellaneous Costs per Day:	\$200
PCR Reagent Cost per Test:	\$0.50
PCR Reagent Cost per Day:	\$250
Total FAD PCR Testing Cost per Day:	\$2,150



BCP: Strategy

Business Continuity Plan

Business Continuity Strategy

- Maintain all routine testing.
- Maintain proportion of routine testing.
- Discontinue routine testing.

Business Discontinuity Strategy

☐ Laboratory Sample Relay

☒ Client Sample Relay

Laboratory Sample Relay Costs	
Cost Driver	Cost (Daily)

Client Sample Relay Costs	
Cost Driver	Cost (Daily)
Loss of Client Goodwill	INTANGIBLE
Loss of Passive Surveillance Capability	INTANGIBLE



BCP: Cost/Profit Analysis

Routine PCR & ELISA Test Cost & Profit Analysis

☐ Use PCR Test Figures from Surge Capacity Section

Average # of Routine PCR Tests Conducted Daily: **2000**

Routine PCR Testing Cost Data

Number (#) of Technicians (Routine):	5
Routine Technician Daily Cost per Employee:	\$200.00
Total Regular Staff Daily Cost	\$1,000
Administration & Miscellaneous Costs:	\$200
PCR Reagent Cost per Test:	\$2.00
PCR Reagent Cost per Day:	\$4,000
Total PCR Routine Testing Cost per Day:	\$5,200

Routine PCR Testing Profit Data

Routine PCR Price Charged per Test:	\$4.00
Routine PCR Cost per Test:	\$2.60
Routine PCR Profit per Test:	\$1.40
Routine PCR Revenue per Day:	\$8,000
Routine PCR Cost per Day:	\$5,200
Routine PCR Profit per Day:	\$2,800

☐ Use ELISA Test Figures from Surge Capacity Section

Average # of Routine ELISA Tests Conducted Daily: **2000**

Routine ELISA Testing Cost Data

Number (#) of Technicians (Routine):	5
Routine Technician Daily Cost per Employee:	\$200.00
Total Regular Staff Daily Cost	\$1,000
Administration & Miscellaneous Costs:	\$200
ELISA Reagent Cost per Test:	\$2.00
ELISA Reagent Cost per Day:	\$4,000
Total ELISA Routine Testing Cost per Day:	\$5,200

Routine ELISA Testing Profit Data

Routine ELISA Price Charged per Test:	\$4.00
Routine ELISA Cost per Test:	\$2.60
Routine ELISA Profit per Test:	\$1.40
Routine ELISA Revenue per Day:	\$8,000
Routine ELISA Cost per Day:	\$5,200
Routine ELISA Profit per Day:	\$2,800



BCP: FAD Impact on Profit

FAD Impact on PCR & ELISA Routine Testing Revenue & Profit

Select an Estimated FAD Outbreak Duration (Weeks):

25

Select the Number of Testing Days per Week:

7

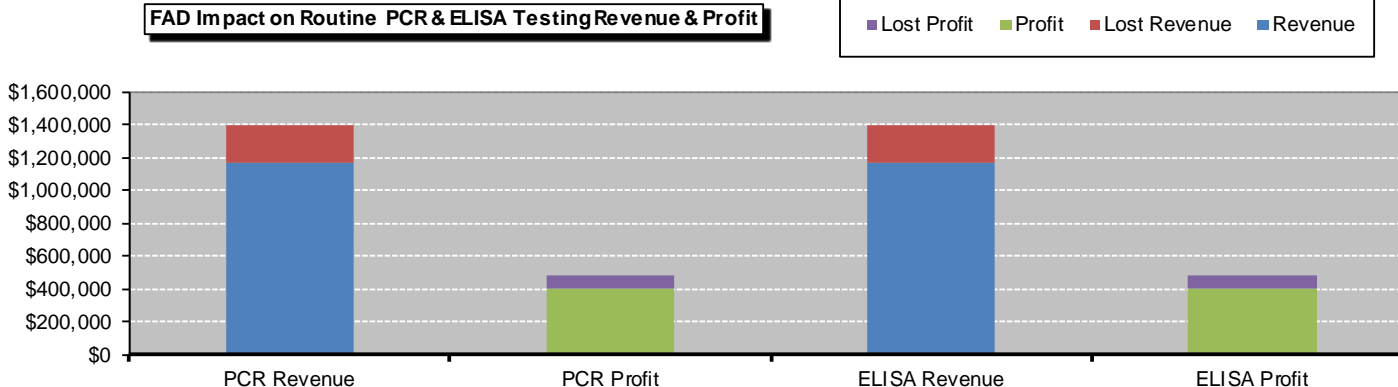
Routine PCR Business Continuity (%) During a FAD:

83%

Routine ELISA Business Continuity (%) During a FAD:

83%

FAD Impact on Routine PCR & ELISA Testing Revenue & Profit



Revenue	PCR Revenue	PCR Profit	ELISA Revenue	ELISA Profit
Lost Revenue	\$1,166,667		\$1,166,667	
Profit	\$233,333	\$408,333	\$233,333	\$408,333
Lost Profit		\$81,667		\$81,667

Background

CAHSN

Survey

Checklist

Financial
Template



Management Summary

Surge Capacity

Variable	Result	Comment
PCR Test Capacity	Maintain normal operating capacity of: 2,500	Daily Routine PCR Tests: 2,000. Planned Routine Capacity: 83%
PCR FAD Testing Cost (Daily)	Daily Cost for FAD testing: \$2,150	Based on estimated level of 500 FAD tests required daily
ELISA Test Capacity	Maintain normal operating capacity of: 2,500	Daily Routine ELISA Tests: 2,000. Planned Routine Capacity of: 83%
ELISA FAD Testing Cost (Daily)	Daily Cost for FAD testing: \$2,150	Based on estimated level of 500 FAD tests required daily



Management Summary

Business Continuity

Variable	Result	Comment
Business Continuity Strategy	Maintain proportion of routine testing and lab will relay surge client samples	Note Laboratory Sample Relay Costs and Cost Driver
Business Discontinuity Strategy	Note associated costs with lab sample relay per day: \$180	Costs associated with lab sample relay: Courier Charges and Administrative Costs
FAD Outbreak Impact on PCR Revenue & Profit	Lost Revenue of \$233,333 and Lost Profit of \$81,667	Result based on a FAD outbreak lasting 25 weeks and a PCR routine testing continuity level of 83%
FAD Outbreak Impact on ELISA Revenue & Profit	Lost Revenue of \$233,333 and Lost Profit of \$81,667	Result based on a FAD outbreak lasting 25 weeks and a PCR routine testing continuity level of 83%



Lab Emergency Management Financial Template



Veterinary Diagnostic Lab Financial Template

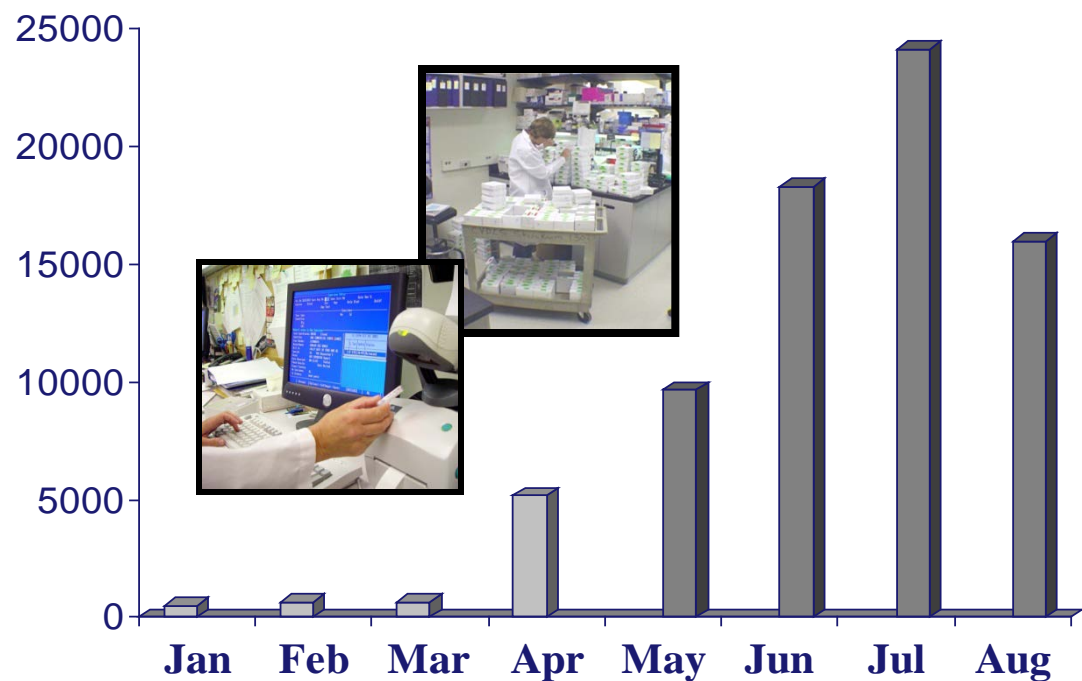
Product:	Veterinary Diagnostic Lab Financial Template	Reset
Designer:	Kevin McLeod	
Company:	Animal Health Laboratory, University of Guelph	
Email:	kmcleod@uoguelph.ca; mspinato@uoguelph.ca	
Objective:	Assist Veterinary Labs in Emergency Planning	
File Name:	Veterinary Lab Diagnostic Template Version 2.2 BETA Ready.xls	
Version:	v2.2 15-Nov-2012	
Audit Status:	Completed Draft	
Units (Currency):	Canadian Dollar (CAD)	
Select:	<div><div>Main Menu</div><div>Management_Summary</div><div>Emergency_Management_Plan</div><div>Surge_Capacity</div><div>Business_Continuity_Plan</div><div>Standard_Formats_Map</div></div>	

Next Steps:

- ❖ Currently undergoing beta testing
- ❖ Revise and finalize financial template
- ❖ Present results at the 13th annual CAHLN meeting, St-Hyacinthe QC, June 2013



Lab Emergency Preparedness – All Hazards



Business Continuity???





References

Laboratory Exercises, Kris Clothier and Pat Blanchard, 2008 NAHLN Emergency Response Symposium, Greensboro, NC, USA

Suggested Laboratory Guidelines for Animal Health Emergency Management, AAVLD Emergency Preparedness Workgroup, November 2004

Developing Laboratory Response Plans, Ron Wilson, NAHLN/AAVLD Laboratory Emergency Management Subcommittee Joint Symposium, October 2006, Minneapolis, MN.





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Ontario
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