Investigation of Q fever in Bosnia-Herzegovina, 2000: An Example of International Cooperation

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Q fever

- *Coxiella burnetii*
- Zoonosis, contact with livestock (sheep, cattle, goats)
- Resistant to environmental extremes; wind-borne spread
- Worldwide distribution; previously considered common in Eastern Europe (“Balkan fever”)


Novi Sad
Danube
Slavonski Brod
Sava
Federation of Bosnia and Herzegovina
Ruma
Prijedor
Una
Bosna
Republika Srpska
Banja Luka
Brčko
(The status of Brčko will be determined by arbitration.)
Bihać
Doboj
Bijeljina
Šabac
Sava
Inter-Entity Boundary Line (IEBL)
(Dayton agreement line)
Udbina
Ključ
Tuzla
BOSNIA
AND
HERZEGOVINA
Drina
Ser
Vrbas
Zenica
Srebrenica
Knin
Glamoč
Žepa
Sarajevo
Užice
Pale
Šibenik
Federation of Bosnia and Herzegovina
Drina
Gorazde
Split
Mostar
Otok Brač
Republika Srpska
Lim
Piva
Tara
Otok Hvar
Ploče
Komarnica
Otok Korčula
Neum
Montenegro
Nikšić
CROATIA
Dubrovnik

Introduction

- In June 2000, increase in Q fever cases in FBiH
  - Mostar, Kakanj
  - No diagnostic testing for humans available

- Objectives:
  - Develop laboratory capabilities within FBiH to diagnose Q fever in humans and animals.
  - To assess the occurrence of and risk factors for Q fever among humans.
  - To develop public health recommendations to control disease transmission.

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Laboratory Diagnostics

- IFA, species-specific conjugate
- Specimens screened 1:16, IgG
- Human sera
  - Phase II antibody (acute)
  - Phase I antibody (chronic)
  - Geometric Mean Titers (GMT)

Epidemiologic Assessment

- Tested human and animal specimens from all over FBiH
- Mostar – descriptive epidemiology of cases
- Kakanj – descriptive epi and case-control study

Results – Animal Diagnostic Specimens by Species

Species	*n*	No. positive	% Positive
Sheep	536	23	4%
Cattle	815	84	10%
Goats	39	0	0%

Preliminary results; specimens from all over FBiH.
Specimens screened for Phase I antibody at 1:16.

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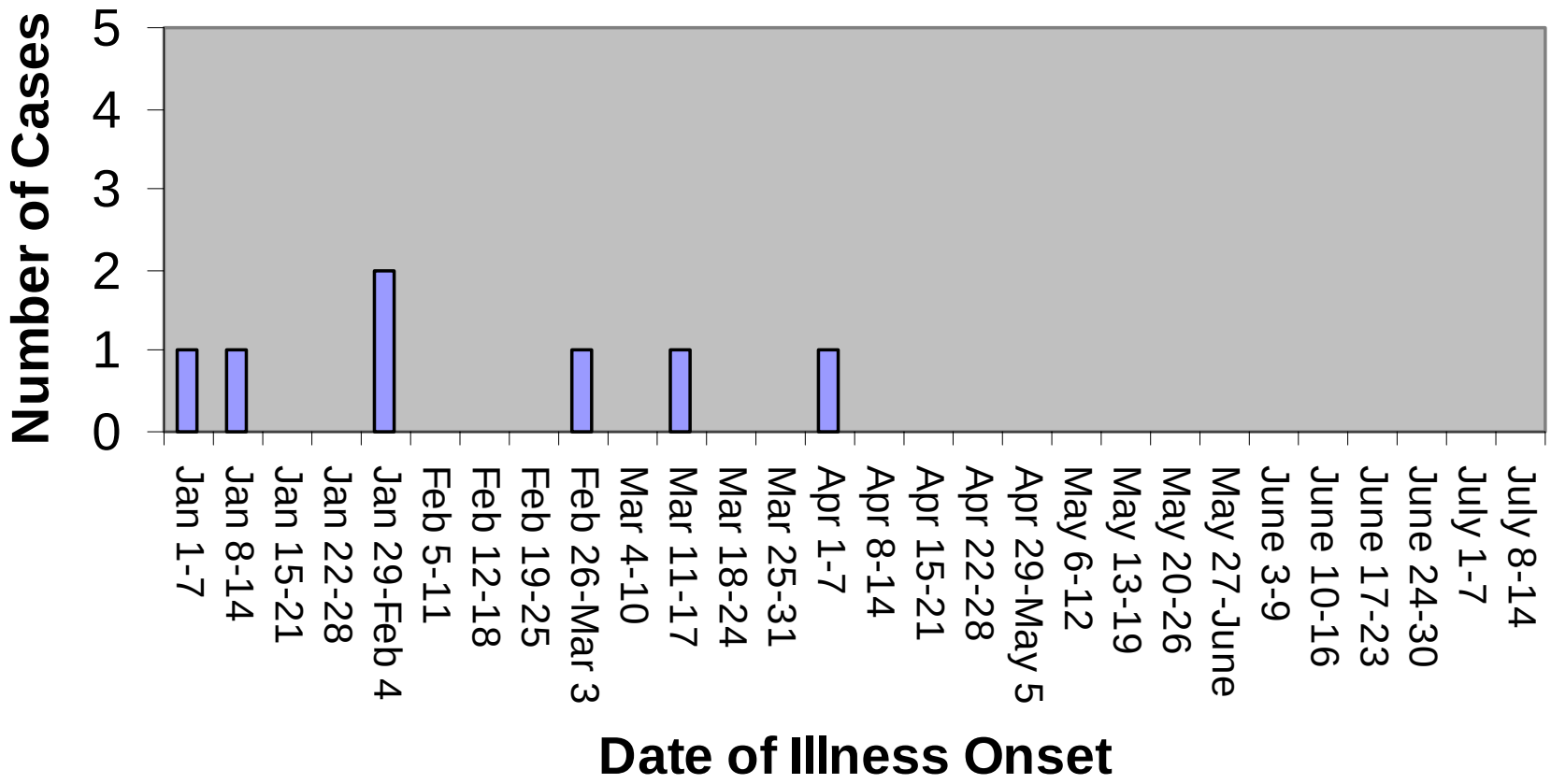
Results – Human Diagnostic Specimens by Town

Town	*n*	Phase I Positive (%)	Phase I GMT	Phase II Positive (%)	Phase II GMT
Mostar	**219**	**120 (55%)**	**100**	**127 (58%)**	**85**
Bogodol	30	23 (77%)	46	22 (73%)	66
Goranci	55	30 (55%)	140	30 (55%)	161
Kakanj	**151**	**42 (28%)**	**667**	**54 (36%)**	**733**
Bihac	15	6 (40%)	256	7 (47%)	232
Kalesia	22	3 (14%)	81	3 (14%)	406
Konjic	12	11 (92%)	451	11 (92%)	796
Sarajevo	12	4 (33%)	64	5 (42%)	256
Tesanj	23	2 (9%)	23	2 (9%)	45
Travnik	13	5(38%)	84	6 (46%)	102
Overall	**749**	**272 (36%)**	**134**	**299 (40%)**	**153**

Mostar Results

- Case: Illness (fever plus other symptoms) since 1/1/00; Phase II titer >= 128, and Phase II >=I;
  - ***n* = 7**
  - Phase I GMT: 105
  - Phase II GMT: 256

Mostar Cases – Illness Onset



Kakanj Results

- Case: Illness (fever plus other symptoms) since1/1/00, Phase II titer >= 128, and Phase II >=I;
  - ***n = 23***
  - Phase I GMT: 1264
  - Phase II GMT: 3631

- Control: No illness since 1/1/00, Phase II and I antibody titer < 16;
  - ***n = 22***

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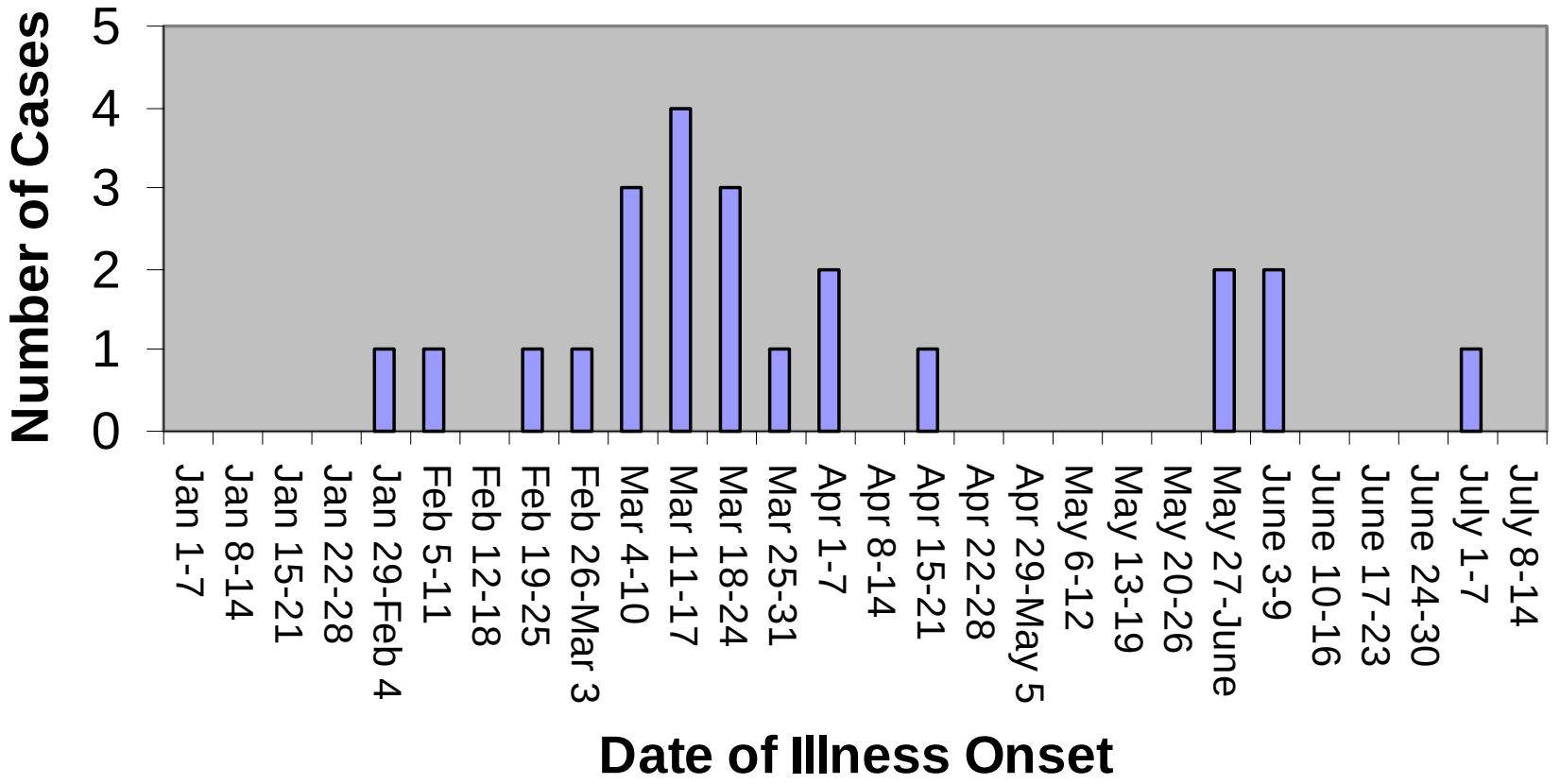
Kakanj Cases – Illness Onset



Kakanj Results

Variable (*n* Case/*n* Control)	**No. Cases**	**No. Controls**	**Odds Ratio** (95% Confidence Interval)	**p** (* Fishers)
Handle Sheep (23/22)	1	5	0.15 (0.01-1.65)	0.10*
Handle Cattle (23/22)	2	7	0.20 (0.02-1.35)	0.07*
Milk from neighbor (17/19)	11	5	5.13 (1.01-28.25)	0.02
Outdoor activities (23/21)	18	12	2.7 (0.61-12.44)	0.13

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Conclusions

- Evidence of widespread Q fever in FBiH

- Evidence of acute Q fever outbreak in Kakanj
  - not associated with direct livestock exposure
  - hypotheses: possible wind-borne spread or contaminated milk products

- Could not confirm an outbreak of Q fever in Mostar
  - few cases, low GMT
  - overall GMT in Mostar more consistent with endemic disease than acute infection

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Recommendations

- Effective control will require long-term cooperation between veterinary and medical communities.

- To prevent future outbreaks, public education will be important.
  - consume only boiled or pasteurized milk products.
  - avoid contact with birthing materials
  - encourage better farm management practices to minimize local infections and wind-borne spread

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Accomplishments

- Provided veterinary and medical staff in FBiH with laboratory supplies and expertise to conduct *C. burnetii* IFA.
- Encouraged greater cooperation between medical and veterinary communities within FBiH.
- Facilitated the first meeting between veterinary officials from FBiH and the Republic Srpska since before the civil conflict.

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