

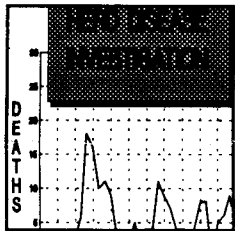
# POPULATION MEDICINE NEWS

Epidemiology, Preventive Medicine, Public Health  
Production Medicine, Computer Applications in Vet Med

January 4, 1993 6(1)

## RISK GROUP ANALYSIS

*An essential step in any problem solving is answering the who-, what-, when-, where-, how many-questions. For herd investigation, this requires the use of risk group analysis. The following quiz presents the concept. Be careful!*



### Quiz:

Consider the data in Figures 1 through 3. They display the cases of an obscure diarrheal syndrome in a dairy herd. What hypotheses can we make based

### Part 9

on these graphs? Make your decisions and read the answers on the back.

### Outline of the managerial problem solving approach of Plunkett and Hale. \*

"1. State the problem....

2. Describe the problem... [what, where, when, how many, which ones, i.e., risk group and temporal analysis]

3. Identify differences between affected and unaffected objects, units, or persons... [inferences made from risk group analysis]

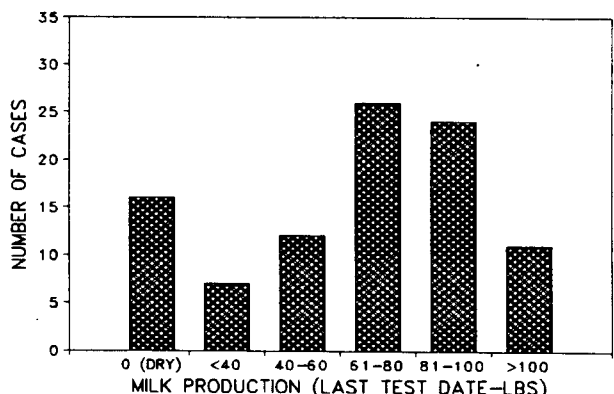
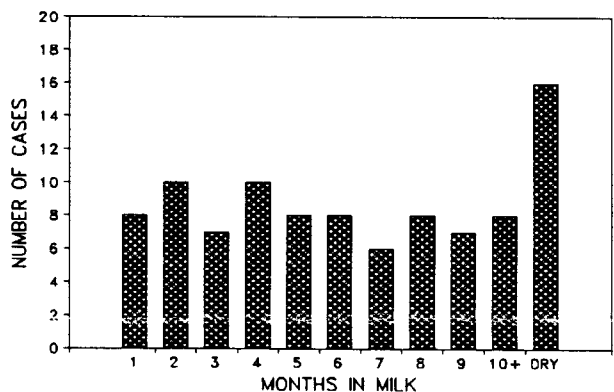
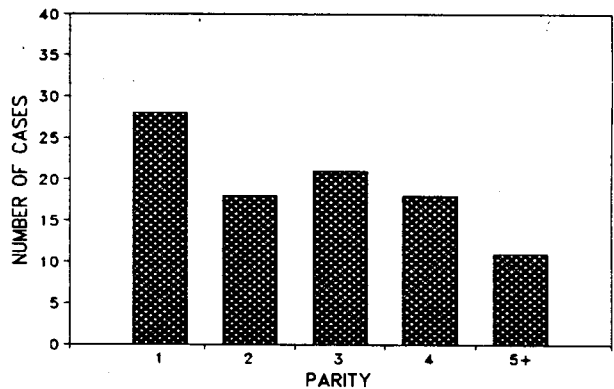
4. Identify changes that are associated with the problem... [inferences made from temporal analysis]

5. Generate likely causes... [Hypothesis or ruleout list]

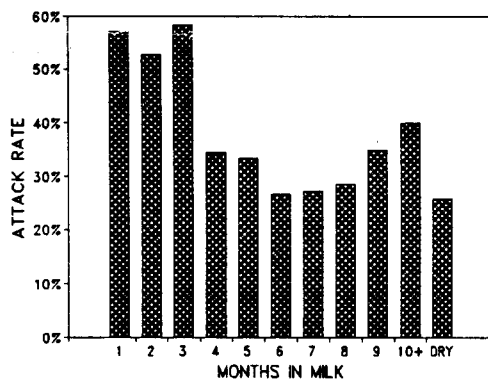
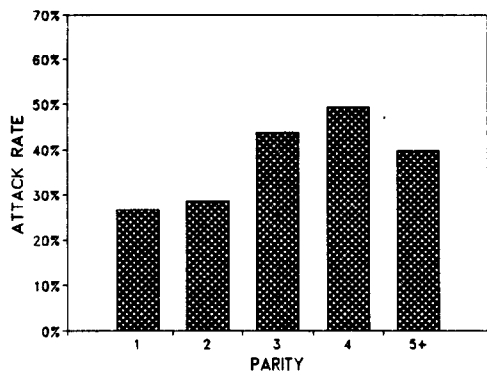
6. Consider the most likely cause...

7. Verify the most likely cause..." [Strategic lab sampling, intervention trials, prospective data gathering]

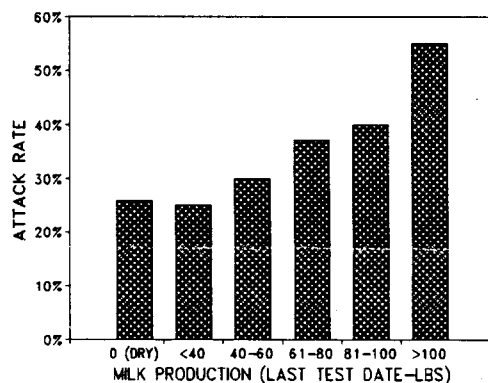
\* described by RK Wagner in Managerial problem solving, in *Complex Problem Solving: Principles and Mechanisms*, Sternberg RJ and French PA, editors, Lawrence Erlbaum Associates, Hillsdale, NJ, pp. 159-183.



	A	B	C	D	E	F	C	D	E	F	G	H	I
PARITY		1	2	3	4	5+	TOTAL						
CASES		28	18	21	18	11	96						
NUMBER PRESENT		105	63	48	36	28	280						
ATTACK RATE		26.7%	28.6%	43.9%	49.5%	39.8%	34.3%						
MONTH IN MILK		1	2	3	4	5	6	7	8	9	10+	DRY	TOTAL
CASES		8	10	7	10	8	8	6	8	7	8	16	96
NUMBER PRESENT		14	19	12	29	24	30	22	28	20	20	62	280
ATTACK RATE		57.1%	52.6%	58.3%	34.5%	33.3%	26.7%	27.3%	28.6%	35.0%	40.0%	25.8%	34.3%
MILK PRODUCTION		0 (DRY)	<40	40-60	61-80	81-100	>100	TOTAL					
CASES		16	7	12	26	24	11	96					
NUMBER PRESENT		62	28	40	70	60	20	280					
ATTACK RATE		25.8%	25.0%	30.0%	37.1%	40.0%	55.0%	34.3%					



Your answer on the reverse side should have been something like: You cannot evaluate risk without knowing both the number of cases within each group and the number of individuals at risk within those groups. Since you do not know the latter from the data displayed on the front, no (legitimate) inferences could be made regarding the risk associated with parity, stage of lactation, or production groups.



Based on the graphs on this page, state your conclusions. An interpretation is provided in the box to the right.

POPULATION MEDICINE NEWS is produced by the Washington State University Field Disease Investigation Unit, Pullman, WA 99164-6610 (509-335-0711) and is supported in part by the WSU Cooperative Extension Service. Viewpoints expressed are not necessarily those of the University or its Administration. This newsletter may be copied by anyone. Editors: Dale Hancock and Susan Holler.

**ANSWER**

Remember, the goal is to create a hypothesis list with the goal of narrowing our investigation and providing order to it. We are not trying to achieve a solution with risk group analysis alone.

Based on the tendencies toward higher risk in older, higher producing, early lactation animals, we should hypothesize a feedborne problem since these animals have substantially higher dry matter intakes. Since all lactational stages as well as dry cows are affected, any offending feed source would have to be common to all groups. Certain infectious processes (e.g. salmonellosis) might also be more likely to produce disease in early lactation, high producing cows, and would be expected to produce some cases in all groups. These should also be on the ruleout list. Temporal analysis (not given here) would be very helpful in deciding if this might be an infectious process and/or for identifying the onset of a possible feedborne exposure.