

# Pig associated methicillin-resistant Staphylococcus aureus (MRSA): family transmission and clinical aspects

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Question: The prevalence of veterinarian MRSA CC398 infected or colonized men and animals in pig farming is high and increasing in Denmark. It is a major health problem and should we worry?

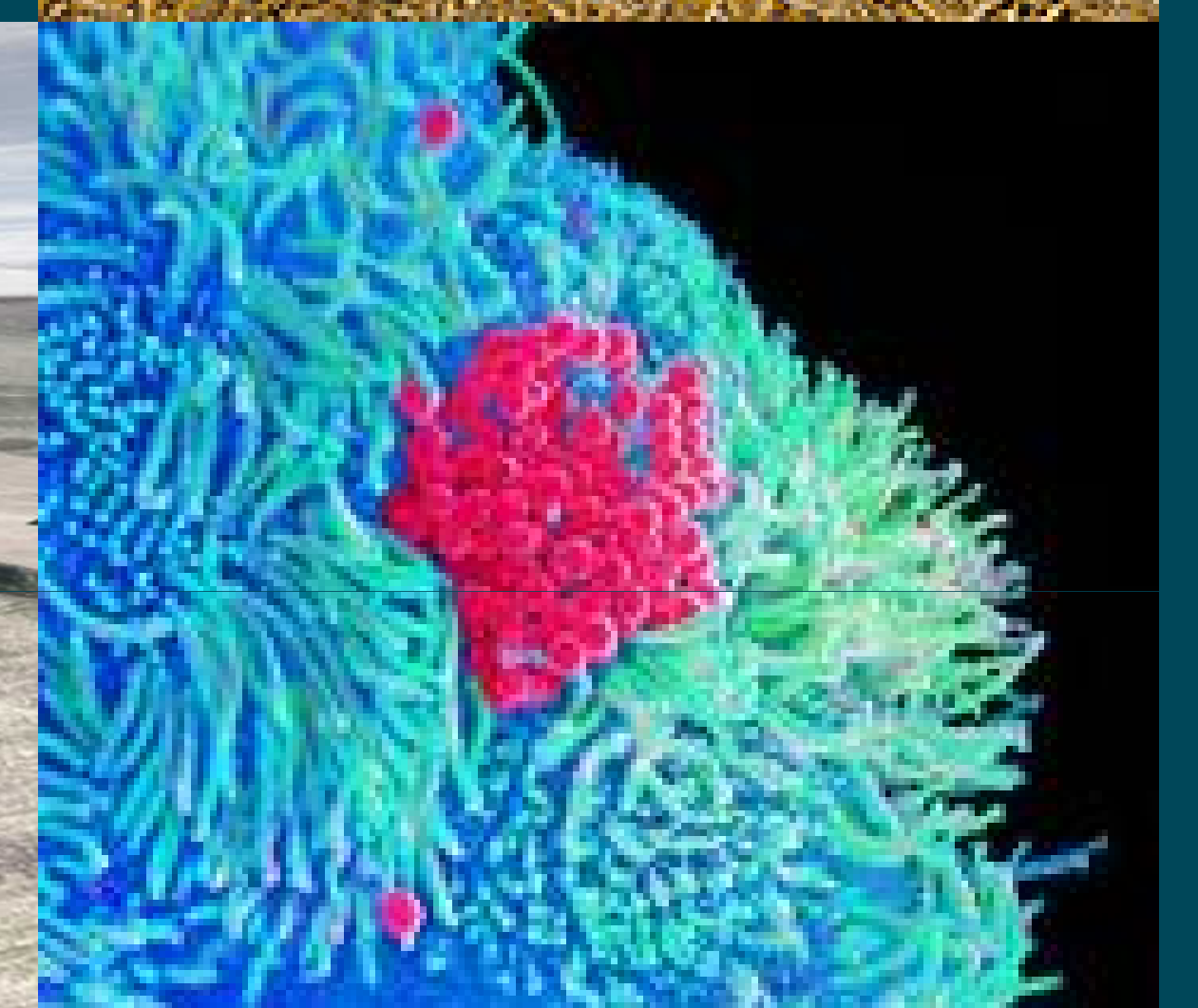
Number of reported MRSA cases from Region North 2008 and 2009

MRSA CC-type	N:	Average age (min – max)	Sex M/F	Work related/ Not work related	Disease/ Carrier condition
CC398	26	29,2 (2 - 59)	16/10	16/10 not stated	7/19
CC22	7	49,3 (8 – 69)	3/4	1/6	3/4
CC30	14	35 (16 – 66)	7/7	1/13	9/5
CC8	12	45,9 (15 – 91)	5/7	2/10	6/6
CC1	3	46 (17 – 66)	1/2	0/3	3/0
CC12	3	29,3 (21 – 45)	1/2	0/3	1/2
CC45	1	44	1/0	0/1	Other
CC5	18	38,9 (0,3 – 66)	8/10	0/18	10/7 one without info
CC72	6	33 (3 – 72)	4/6	0/6	3/2 (one other)
CC80	8	38,5 (1 – 67)	4/4	0/8	5/8
CC88	9	25,7 (0,4 – 66)	3/6	0/9	4/4 (one other)
CC97	1	52	1/0	0/9	1/0
ST 152/377	2	26 (19 – 33)	1/1	0/1	1/1
TOTAL	110		55/55	20/90	52/58

## MRSA CC398 Exposure



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### General aspects of exposure:

The prevalence of Danish pigs infected by veterinarian MRSA CC398 is high estimated to 13% indicating a reservoir of  $> 2.5 \times 10^6$  infected pigs in the Danish confinement buildings. The increase in infected pigs may be associated to the growing use of antibiotic in pig herds. The prevalence and virulence of infections in Denmark is not known.

Since 2006 all Danish physicians must report MRSA infections to the Danish authorities. We have analysed reported new cases of MRSA infection in the northern part of Jutland in 2008 and 2009.

### Study data:

Accessible information was type of bacteria, conditions of infection, infection at work, carrier/illness, indication for testing, infected abroad, type of occupation, and self-employed. We found 110 new cases of MRSA. The most frequent was veterinarian MRSA CC398 by 26 cases and 7 (27%) were related to disease. 20 cases were characterised as infection at work. Of these 16 (80%) were veterinarian MRSA CC398 and all cases were associated to work in swine confinement buildings. The other 4 cases were associated to hospital work abroad of type CC22, CC30, and CC8. The 10 cases of veterinarian MRSA CC398 cases not related to work were horizontal infections into family members of subjects working with pigs.

### Conclusions:

Veterinarian MRSA CC398 is present in Danish pigs as well as in humans working in swine confinement buildings. There is no national data of virulence of the bacteria or clinical aspects of the infection, but due to the infectious reservoir and possible harmful health conditions action should be taken to reduce this bacterial exposure.