

OUTCOMES OF HEMODIALYSIS PATIENTS WITH MERS-COV EXPOSURE IN KOREA

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Introduction

- A large outbreak of the Middle East respiratory syndrome corona virus (MERS-CoV, **Figure 1**) infection occurred in Korea from May 2015 to July 2015.
- According to the report about the hospital outbreak of MERS-CoV infections in Saudi Arabia, a half of cases was acquired by person-to-person transmission in hemodialysis (HD) units (NEJM 2013;369:407).
- In Korea, only one patient with maintenance HD was transmitted in emergency room (ER), though there had been 186 laboratory-confirmed cases with healthcare facilities during the outbreak (**Figure 2**).

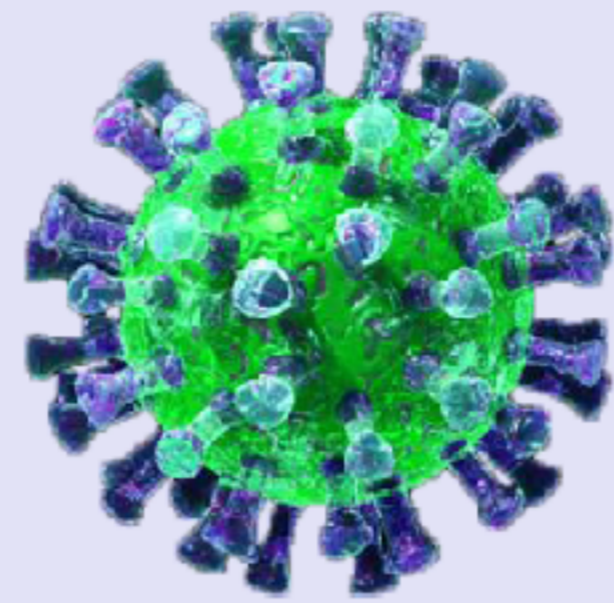


Figure 1. Middle East respiratory syndrome coronavirus

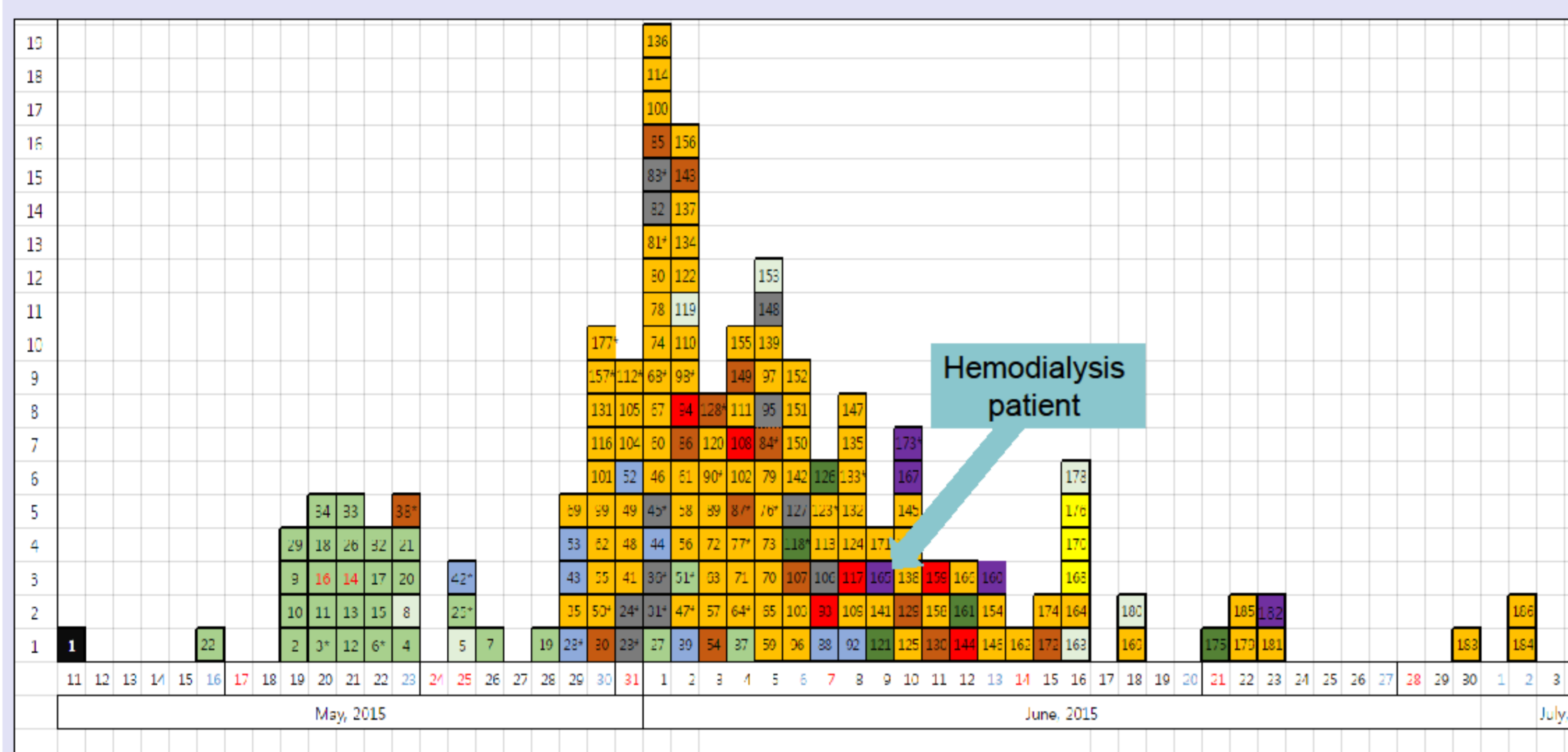


Figure 2. 2015 MERS outbreak in Korea.

- Strategies to contain the spread of MERS-CoV depend on knowledge of human-to-human transmission. There has been no targeted study of secondary transmission in HD unit.

Methods

- We studied HD clusters that were incidentally exposed to patients or health care workers with confirmed MERS-CoV infection.
- Probable cases of secondary transmission were identified on the basis of reactivity in two reverse-transcriptase-polymerase-chain-reaction (RT-PCR) assays with independent RNA extraction from respiratory secretions.

Results

1. Characteristics of confirmed cases

- Out of the 186 cases of MERS-CoV infection, 111 were male and 75 were female. Age groups of confirmed cases are shown in **Table 1**.
- There are 82 cases (44%) who were admitted in the same hospital with a confirmed case, 64 cases (34%) who are family members, or visitors, and 39 cases (21%) who are medical staff (**Figure 3**).
- The median incubation period was 6 days (97.3% within 14 days).
- 38 cases had died out of 186, marking the case fatality rate of 20.4%.

Table 1. Age of MERS-CoV confirmed cases.

Age group (y)	All cases (n=186)	Fatal cases (n=36)
10-19	1	0
20-29	13	0
30-39	26	0
40-49	29	1
50-59	42	6
60-69	36	10
70-79	30	12
≥80	9	7

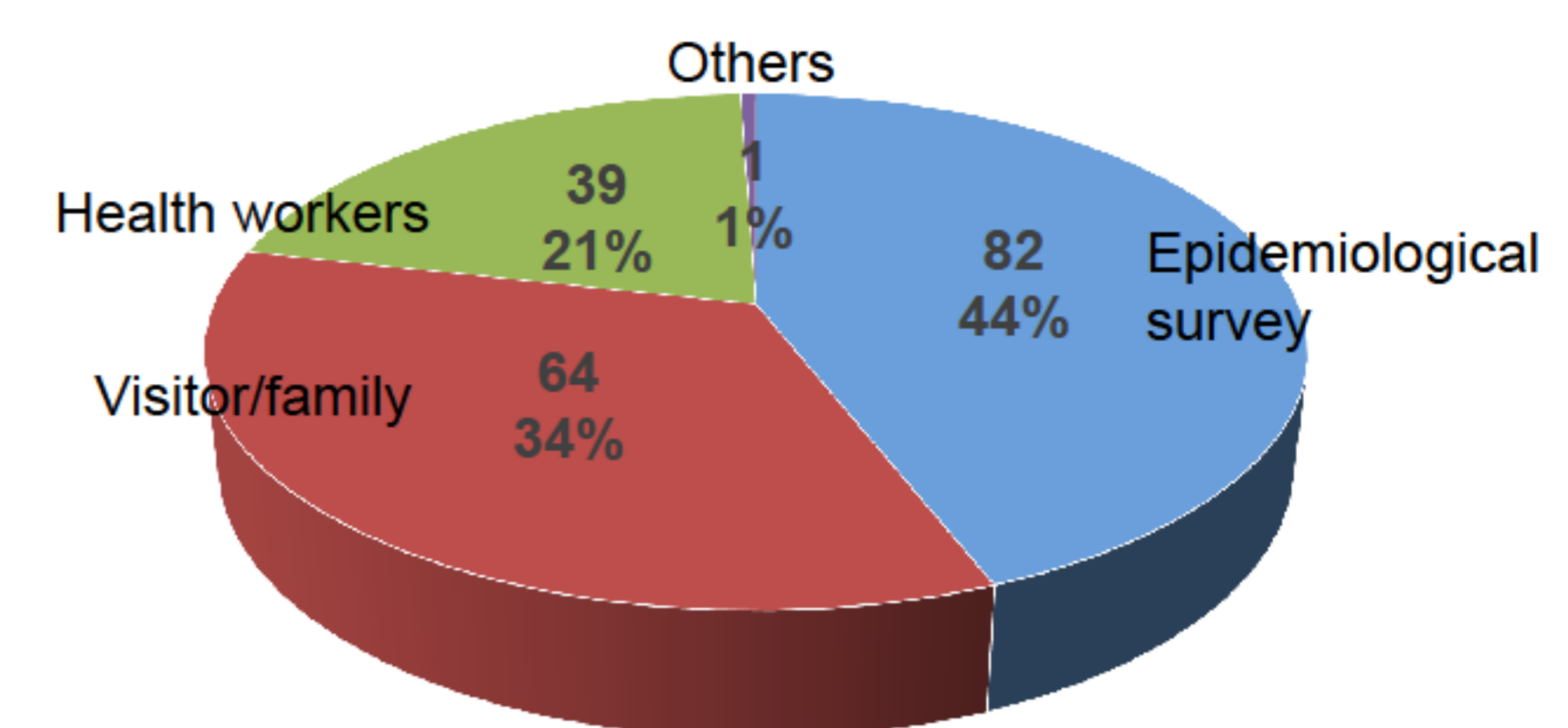


Figure 3. Occupation of infected cases.

2. HD patients with MERS-CoV exposure

- One hundred twenty-five patients and twenty health care workers were exposed to MERS-CoV in three HD units (**Table 2**).
- HD patients with MERS-CoV exposure received different types of isolation practices in consideration of degree of exposure and hospital environment (**Figure 4**).
 - Admission & HD in negative pressure isolation room,
 - Admission & HD in isolation room,
 - Admission & HD in HD units,
 - Cohort isolation (OPD) by providing ambulance.
- No secondary transmission was occurred in HD units.

Table 2. Isolation practices and outcomes in HD units

	Hospital A	Hospital B	Hospital C
Maintenance dialysis patients	92	36	135
MERS-CoV exposure patients	92	25	8
MERS-CoV exposure health care worker	12	7	1
Exposure place	HD unit	HD unit	Outside of HD unit
Exposure source	HD patient	Nurse	ER patient
Isolation practices	<ul style="list-style-type: none"> 64 patients: admission & HD in isolation room, 28 patients: cohort isolation (OPD) 	<ul style="list-style-type: none"> 4 patients: admission & HD in negative pressure isolation room, 21 patients: admission & HD in HD units 	<ul style="list-style-type: none"> 8 patients: cohort isolation (OPD)
Secondary transmission	0	0	0



Figure 4. Different types of isolation practices.

Conclusion

- A lot of cases acquired by person-to-person transmission in HD units in other countries, whereas no secondary transmission was occurred in Korea.
- To establish the best isolation system in HD units, the cost-effectiveness analysis of different strategies and MERS-CoV serological study for asymptomatic infections are needed.