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النشرة الوبائية السعودية

تصدرها وزارة الصحة

الوكالة المساعدة للطب الوقائي وبرنامج الوبائيات الحقلي

المجلد الثاني – العدد الرابع – أكتوبر، نوفمبر، ديسمبر ١٩٩٥م

Risk factors for heat exhaustion among pilgrims to Makkah, Saudi Arabia, 1415 H

Pilgrims to Makkah (Mecca) usually undergo strenuous physical effort during pilgrimage (Hajj) activities, especially during the journeys between Holy places and when they throw pebbles at Jamarat sites. Hajjis move from Mina to Arafat and then back to Mina through Muzdalifa (a 16 mile journey) within 24 hours; some of the pilgrims trek some or all of these distances. These trips could immediately follow another long journey by land from another city that could be hundreds of miles away from Makkah. At the Jamarat sites Hajjis are exposed to an overwhelming crowd. As a result every year thousands of cases of heat exhaustion (HE) occur (Figure 1).

During the 1995 Hajj, (ambient temperature 18.0-43.20°C, relative humidity 11-81%), we conducted a 1:1 matched case-control study to examine the role of some potential behavioral risk factors for HE. A case of HE was defined as weakness, vertigo, headache, gastrointestinal symptoms, with or without faintness and collapse; and rectal temperature between 36° and 41°C. Controls were randomly selected from other Hajjis on the last day of Hajj. They were matched by age and sex. Hajjis who escorted a case of HE or shared the same tent or bus with him were excluded. Patients (N = 97) and controls were interviewed to ascertain use of umbrellas, means of transportation between holy places, lodging, frequency of drinking fluids and beverages, and knowledge about heat-associated illnesses (HAI).

Cases of HE (mean age in years+SD=39.4 +16.3, range =14-78) constituted 20 different nationalities, mainly from countries in the Middle East. About half of the cases (51.5%) were residents of Saudi Arabia. Cases were admitted to the hospitals throughout the day as early as 6:45 A.M. and as late as 11:25 P.M. However, about one third of the patients (34.7%) were admitted before noon, a third between 12:00 noon and 4:00 p.m. (33.7%), and the last third was admitted thereafter. Most patients were brought to the hospital by ambulance (N=69, 71%), 19 (19.6%) by other pilgrims, and only nine patients (9.3%) walked in the outpatient clinics unaided. Male-female sex ratio was 4:1.

The main symptoms of the cases were headache (76.3%), dizziness (55.7%), muscle cramps (42.3%), malaise (35.1%), anorexia (35.1%) and nausea (33.0%).

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Index to Hajj Issue

Wristband wearing among pilgrims in Mina during Hajj 1415 H

Each year more than two million Muslims from countries throughout the world arrive in Makkah, Saudi Arabia (SA) to perform Hajj. These pilgrims speak diverse languages. They are often older adults who have a variety of underlying health conditions. The congestion and mass movement may place additional stress on these adults during the pilgrimage. Emergency medical intervention becomes complicated when medical history is difficult to extract due to medical conditions or language barriers. Moreover, in the case of death, it is difficult for the Ministry of Health (MOH) to return an unidentified body to the country of origin. To relieve these difficulties MOH introduced identification wristbands (WB) to be used during every Hajj season.

Standard WB developed by MOH contain information about personal identification: name, nationality, a computer number is assigned, as well as five underlying health conditions, (Diabetes, Epilepsy, Hemophilia, under Cortisone treatment, and Sensitivity to penicillin). WB are distributed to everyone wishing to perform Hajj from SA through Primary Health Care Centers (PHCC) throughout SA. Pilgrims from outside SA obtained WB from either the Experimental National Establishment for Pilgrims (ENEP) or from their original countries.

To ascertain where WB were obtained and what information they contained, we did single stage cluster sampling of 400 pilgrims in 40 camps in Mina. Each pilgrim was checked for a WB and given a standard questionnaire.

Seventy-three percent (CI=68% to 77%) of pilgrims wore WB of any type. The majority (63%, CI= 58% to 69%) obtained the WB in SA from any of the WB sources. Only 21% (CI=16% to 26%)of pilgrims wore WB which contained all information required by MOH.

All pilgrims from SA obtained their WB from PHCC. Of pilgrims from SA, 9% (CI=4% to 14%) of Saudi citizens and 13% (CI=6% to 19%) of non-Saudis were wearing WB. These WB were obtained from PHCC. None of the pilgrims from the Gulf Region wore WB, however 92% (89% to 95%) of the pilgrims from outside SA wore them.

Of those wearing WB, 51% (CI=45% to 57%) stated that they would be able to replace the WB if lost. Replacements come through the ENEP (60%), the original countries' missions (26%), medical groups (7%), and PHCC (8%). ENEP was the primary source of information about the importance of wearing WB (54%) (Table 1).

We selected 31 physicians for interview from two hospitals and six PHCC in Makkah through a simple random sampling to learn what they knew about WB and how the WB were distributed. The quantities of WB distributed during Hajj 1415 varied from 10 to 680 per health unit with a mean of 142 (standard error = 65). In hospitals, WB were distributed only to admitted patients. In the PHCC, 42% were distributed because of the patient's condition, 33% for pilgrims and 25% on request.

The percentage of physicians who knew what the headline content of the WB was, is as follows: name 97%, nationality 90%, computer number 77%, health status 64%. The percentage of physicians who knew the meaning of health status abbreviations for Diabetic, Epileptic, Hemophilic, Cortisone, and Sensitivity to penicillin was 81%, 23%, 6%, 19%, and 42% respectively. However, 84% of physicians had obtained medical conditions verbally from patients rather than the WB.

--Reported by Dr. Adel Turkistani, Dr. Nader Alshreef,and Dr. Nasser Al Hamdan (Field Epidemiology Training Program)

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Table 1. The sources pilgrims learned about or obtained wristbands during Hajj 1415

Source	No. of pilgrims	%	L 95% CI	U 95% CI
ENEP *	158	54	48.57	60.02
O.C.** Hajj dept.	70	24	19.14	28.97
O.C.** MOH	28	10	6.23	13.01
PHCC ***	21	7	4.24	10.19
Travel office	9	3	1.1	5.08
Radio	2	1	0	1.64
Press	2	1	0	1.64
Total	290	100		

ENEP * = Experimental National Establishment for Pilgrims.

O.C. ** = Original Country.

PHCC *** = Primary Health Care Center.

Wristbands

(Continued from page 2)

Editorial note: This study showed many different types of WB to be in existence. Not all the WB distributed by ENEP contained space for identification or health status. The health sectors and physicians in Makkah did not try to inform the pilgrims of the importance of wearing WB. PHCC were negligent introducing and distributing WB to pilgrims. Even hospitals in Makkah did not fill in the information completely. There was a great deal of misunderstanding about the purpose of WB, and this explains why a high percentage of pilgrims from SA and the Gulf Region were not wearing WB.

The high percentage of pilgrims wearing the WB showed pilgrims approved and understood the importance of wearing WB. It was unfortunate, however that many of these WB did not meet the criteria required by MOH. The study results suggest that it would be easy to change all types of WB used recently to the WB designed by MOH.

WB wearing can be promoted by reminding physicians in the PHCC of the importance of WB, by distributing. WB to everyone wishing to perform Hajj, and by advertising using posters and pamphlets. Advertising should begin one month before Hajj season. Public messages should be continually broadcast during the Hajj season on the importance of wearing WB. MOH must coordinate with ENEP and make sure WB contain all necessary information. Offices should be established at Saudi borders to distribute the WB.

Food poisoning in Makkah, Hajj 1415 H

Eight women from four different families decided to perform Hajj together. Six of the women live in Makkah, the other two live in Al Baha. The family from Al Baha stayed with one of the families in Makkah. The women decided that each family would prepare one food item to share among the group while performing Hajj.

On the morning of 9 Dhul Higga H (May 9 G) between 8:00 a.m. and 11:00 a.m., the three families from Makkah prepared food for the trip at their separate homes. The two women from Al Baha contributed by helping one of the Makkah families. One woman prepared koftah sandwiches for the group and for her two children. She gave the children koftah sandwiches for breakfast and for lunch before taking them to the baby-sitter. That afternoon all eight women and their driver left for Arafat in one car. The food for the trip was packed in plastic containers, but not packed in coolers or on ice.

In Arafat they shared some of the communal food. No individual food item was eaten by more than two women. They did not eat the koftah.

After 6:00 p.m., they all drove from Arafat to Muzdalifah. At 9:00 p.m. after they had arrived, they ate dinner. All eight women ate koftah sandwiches. Two women also ate meat sandwiches and one also ate cheese sandwiches.

The next morning, 10 Dhul Higga H (May 10 G), between 8:00 a.m. and 3:00 p.m. all eight women developed diarrhea and abdominal cramps. All eight had nausea but nobody vomited. Fever was reported by four patients but not documented. No organism was isolated from the stool.

The two children who had eaten the koftah sandwiches for breakfast and lunch before being taken to the baby-sitter remained well. All eight women had fully recovered in less than two days.

--Reported by Mr. Yahia Mohammed Ali Al-Gahatani (Sahara Hospital, Riyadh) and Dr. Tomader Saeed Kurdi (Environmental Health Department MOH).

Editorial note: As the attack rate (AR) for the koftah sandwiches was 100%, and no other food was eaten by more than two women, it appears that koftah was responsible for the outbreak. Since the children who ate freshly cooked koftah did not become sick, the responsible organism probably required a period of multiplication

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Meningococcal meningitis vaccination

The Ministry of Health wanted to verify the vaccination coverage in 1416 H for meningoccal meningitis (MCM) in order to evaluate the effectiveness of the policy to protect pilgrims from MCM which had been implemented in the past few years. The group of pilgrims who were interviewed about wristbands were also asked about their MCM vaccination status. The coverage was 98.5% among the 400 pilgrims interviewed.

Only six of the pilgrims interviewed were not vaccinated, four of them due to time constraints. The main source of information about MCM vaccination was the press (45%) for pilgrims coming from inside Saudi Arabia (SA) and Hajj department (51%) for those coming from outside SA.

—Reported by Dr. Adel Turkistani, Dr. Nader Alshreef, and Dr. Nasser Al Hamdan. (Field Epidemiology Training Program).

Heat Exhaustion, Makkah 1415

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Eighty patients (82.5%) had no underlying chronic illness. The median systolic blood pressure was 120 mm Hg (inter-quartile range 110-130 mm Hg), and the median diastolic pressure was 77.5 mm Hg (inter-quartile range 70-80 mm Hg). The mean pulse rate per minute (+ SD) was 94 + 12. The mean rectal temperature was 38.9°+ 1.0°(median temperature 39° C); 2 patients had rectal temperatures of 36.6° C and 36.0° C, whereas 2 patients had temperatures of 41° C. All heat exhaustion cases received intravenous fluids. Seventy-four out of 97 cases of heat exhaustion (76.3%) were successfully treated with infusion of 500-1000 ml of normal saline only, or normal saline with 5% dextrose (23.7%). Antipyretics were given to 35 patients (36.1%). It took patients with heat exhaustion 4.04 (+ 1.97) hours to go back to Makkah to perform Twaf-el-Ifada compared with 2.48 (+ 1.66) hours for the controls ($p< 0.05$, t-test difference between 2 means).

Risk factors for HE included traveling by land to Makkah instead of flying (odds ratio [OR]=2.8, 95% confidence interval [CI]1.1-7.6), walking at least one of the four journeys between holy places (OR=3.5, 95% CI 1.7-7.5), not using an umbrella (OR=8.3, 95% CI 4.1-17.1), not staying in a tent or a building in Mina (OR=2.2, 95% CI 1.1-4.1), and being at landmarks in: Mount Jabel-al-Rahama (OR=2.5, 95% CI 1.2-5.3) or Namira Mosque (OR=3.1, 95% CI 1.2-8.7), losing their way in Mina (OR=39.3, 95% CI 5.8 652), taking light or no meals (OR=4.0, 95% CI 2.1-7.6), and early stoning of Jamarat ($p<0.05$ Chi-square for linear trend). Patients paid less for beverages in the 24 hours prior to hospitalization, and drank less water than controls during their movements between holy places ($p< 0.05$,t-test between 2 means). In the last 24 hours prior to hospitalization, cases (N=83) spent 5.2 SR (+ 5.95 SR) to purchase water or other beverages, whereas controls (N=80) spent 6.92 SR + 4.42 SR ($p< 0.05$, t-test difference between 2 means). Receiving free packs of ice-cold water or beverages was protective against HE (OR=0.37 95% CI 0.2-0.7). Chronic underlying illnesses, and educational level were not associated with HE. Only 22-26% of Hajjis knew about heat-associated illnesses.

--Reported by Dr.Ali Saeed Al-Zahrani, Musaad A. Al-Sulaiman and Dr. Hassan E. El Bushra (Field Epidemiology Training Program)

Editorial note: Heat illnesses comprise a group of clinical conditions in which the temperature regulatory mechanism and associated physiological systems are unable to adapt efficiently to the stresses imposed by the surrounding conditions at high temperature[1]. Because the body is 25% efficient in translating calories generated from intense exercise into external work, 75% of all metabolic energy is converted into heat. The thermal burden of exercise is directly proportional to the intensity of effort. The majority of the heat load is lost through radiation, conduction and convection (65%), evaporation from the skin and lungs accounts for 30%; only minor loss through urine and feces (5%)[2]. O vercrowding impedes dissipation of generated heat load.

Over two million Muslim pilgrims are at risk from HAI when they perform the annual pilgrimage (Hajj) to Makkah in hot weather. HAI are the leading cause of hospitalization during Hajj[3,4]. The sudden short-term influx of unacclimatized religious

FIGURE 1. MOVEMENTS OF PILGRIMS (*HAJJIS*) DURING HAJJ

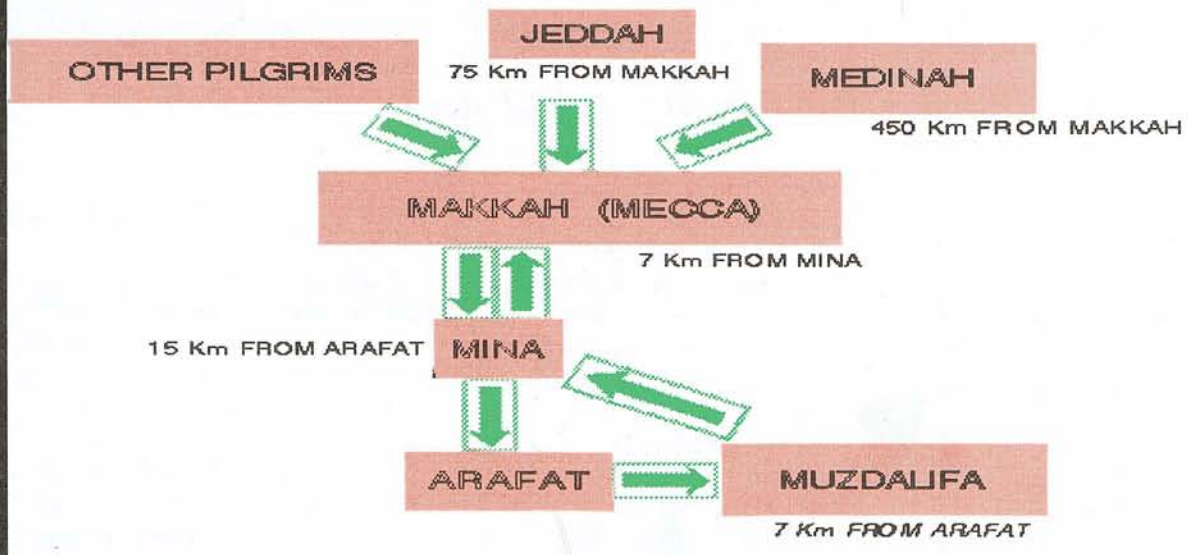
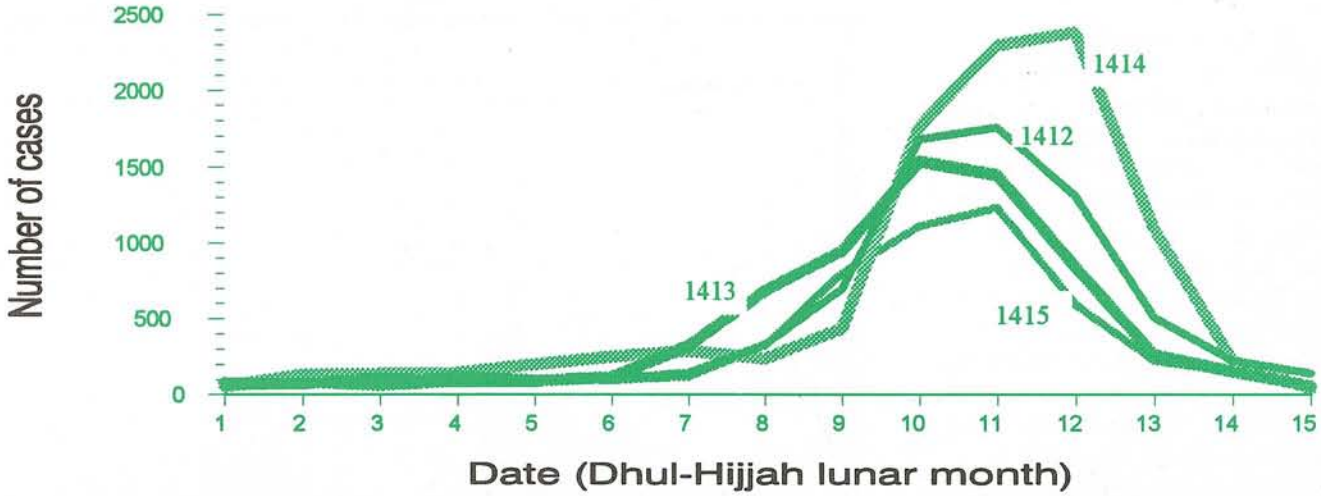


Figure 2. Daily Reported Cases of Heat Exhaustion During Hajj Seasons 1412-1415 H (1992-1995)



visitors of diverse nationalities make risk factors for HAI seen at the Hajj more varied[2]. In the last three years 70-75% of all admissions made during the five days of Hajj were due to heat exhaustion only (Figure 2)[5].

The burden of HE during Hajj can be reduced by promoting many healthy practices; e.g., wider distribution of free packs of ice-cold water to Hajjis. Constructional changes and organization in the holy places to facilitate movements of Hajjis and providing shady areas would be beneficial. Health education programs, especially for domestic Hajjis, remains an important indispensable component in the institution of control measures. Hajjis must be encouraged to use umbrellas.

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Food poisoning in Makkah, 1415 *(continued from page 3)*

after cooking. Although no organism was isolated from the ill women, two organisms are likely causes. *Clostridium perfringens* if present in 10^5 organisms per gram of food will produce diarrhea and colic with onset from eight to 16 hours after eating. *C. perfringens* poisoning symptomatology usually lasts for less than 24 hours, has no associated fever and only rare vomiting. Salmonellosis incubation can range from six hours to four days, produces colic, and diarrhea. It differs from *C. perfringens* food poisoning in that there is often fever, vomiting is more common, and the diarrhea lasts for several days. The lack of vomiting and the short duration of illness suggest *C. perfringens*. However, the fever history of four women suggests salmonellosis.

Both organisms typically produce food borne gastroenteritis if they multiply in the food before it is eaten. Critical time and temperature conditions for multiplication of both organisms in food are food temperatures between 10° and 55° C for five or more hours. *C. perfringens* also requires an anaerobic environment such as provided in a large tightly packed mass of food or in a closed container. The koftah was subjected to all these conditions from just after cooking until it was eaten.

C. perfringens contaminates food as heat resistant spores. The spores germinate when the food is cooked. *C. perfringens* is part of the normal flora of the intestinal tract of mammals and the spores are widespread in the environment. Thus, accidental contamination of food can not be avoided. *C. perfringens* food poisoning is prevented only by avoiding time and temperature abuse of the food after cooking. Salmonellosis is a zoonosis and the organism may be found in a wide variety of animal derived foods including ground meat. It is killed by proper cooking. Thus, salmonella may contaminate the cooked koftah either by incomplete cooking or by cross contamination of the cooked koftah from utensils, containers, or food preparation surfaces used for raw foods.

Rubella outbreak among police cadet training forces during Hajj 1415 H

During the pilgrimage to Makkah in 1415 H (1995), an outbreak of rubella occurred among police cadets on a field training exercise. Ten police cadets were admitted into the Security Forces Hospital in Makkah where they were examined and interviewed. The patients came from the Training City Security Forces Training City (SFTC) in Riyadh. They all complained of mild fever, generalized rash, and post auricular and occipital lymphadenitis. We began an epidemiological investigation to identify the extent of and reasons for the outbreak.

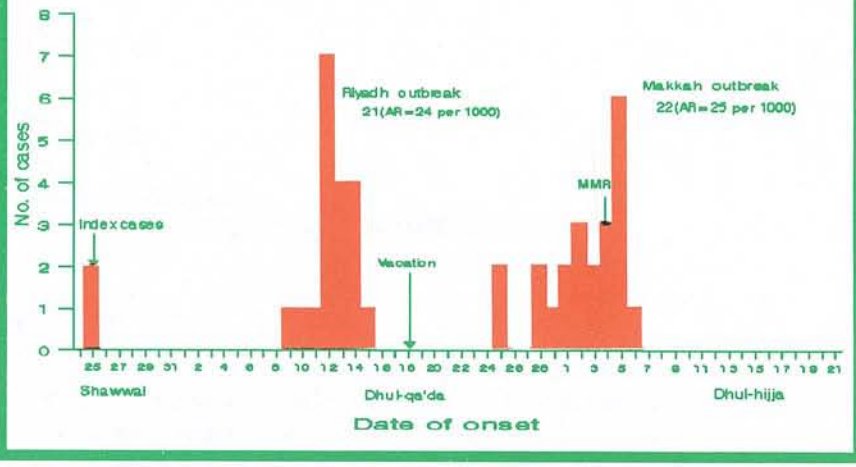
There were 880 cadets accepted for training in 1995 at SFTC in Riyadh. They were divided into 3 groups: group A (299 cadets), group B (281 cadets), and group C (300 cadets). The groups lived in six different dormitories, groups A and B were housed in close proximity while group C was housed further away. Each group had nine different classrooms. They were served by a well equipped dispensary which provided all medical services for cadets, officers, and their families.

We defined a rubella case as development of fever and rash with anti-rubella IgM detected in a cadet from SFTC from 25/10 to 15/12/15H. To find all possible rubella cases, we questioned cadets and reviewed outpatient registries for rashes among cadets in all Makkah hospitals and SFTC dispensaries in Riyadh. We determined the rubella vaccination history by questioning the rubella patients, and we then selected two controls for each case by a systemic random sample.

For seven weeks following the appearance of two rubella cases in Riyadh, 41 additional rubella cases developed (AR 49 per 1000), 21 occurred in Riyadh during routine classes (AR 24 per 1000), the second (22 cases) occurred in Makkah (AR 25 per 1000)(Figure 1).

We identified two index cases from two different groups (group A and B).

Figure 1. Epidemic curve of rubella cases among police cadets training forces in Riyadh and Makkah.



Both index cases began to develop the illness on 25/10/15 H. They developed rubella two weeks after returning from vacation. The two index cases came from different regions (Al Baha and Al Jouf). From 15 to 21 days (median 18) after the onset of rubella in these two cadets, 22 cadets had onset of rubella in Riyadh SFTC. This cluster of rubella cases was followed by the second cluster in Makkah 16 to 21 (median 18) days later.

All three training groups were affected. Attack rates were similar in groups A and B, where the two index cases originated (70 and 60 per 1000 respectively), but lower in group C (17 per 1000). Rubella cases clustered by classroom (chi square 16.5, P value<0.05), and by dormitory (chi square 11.4, P value<0.05). Rubella patients during the first wave of the outbreak in Riyadh were more likely than unaffected cadets to occupy a bed adjacent to a primary case (risk ratio [RR] =5.5, P value < 0.05). Similarly, rubella patients during the second wave in Makkah were more likely than unaffected cadets to occupy a bed adjacent to a rubella patient during the first wave of the outbreak in the Riyadh SFTC dormitory (RR= 14.1, p < 0.0001). After the cases started to appear in Makkah, mass vaccination with MMR was started (figure 1) for cadets and officers, and the follow up of SFTC

--Reported by Dr. Nadir Hassan Alsharif, Dr. Adel Turkistani, Dr. Nasser Al Hamdan (Field Epidemiology Training Program), Dr Saud Al Hasan (Security Forces Hospital, Riyadh), and Ilham Qattan (Disease Control Center, Jeddah).

Editorial note: Most military recruits originate from different rural areas and so have had varied social exposure to communicable diseases. They may not have been given primary vaccinations, nor been exposed to infectious diseases[1]. The rubella outbreak that occurred in Makkah was actually the second wave of an outbreak that began in Riyadh. A sick leave of five days was given by the dermatologist to infected cadets in the first outbreak, but this was by no means sufficient two stop transmission in Riyadh. The source cases had returned from vacation from two different regions that did not experience a rubella outbreak or report rubella cases. During this Eid holiday, flights were full and airports were crowded. It is therefore likely that the source cases were infected while traveling by airplane or while

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Rubella in cadets

(Continued from page 6)

waiting in airports.

The nature of the propagating cases in the epidemic curve, and of the clustering of cases in the same dormitories, and classrooms show that in this outbreak, the rubella infection was transmitted through close contact (person to person). Lack of rubella vaccination and a delayed response to early reports of rubella led to this outbreak which interfered with the cadets' training.

Rubella cases and suspected outbreaks should be reported immediately to the local health department. An accurate assessment of rubella elimination can be made only through aggressive case finding. Surveillance of rubella must be intensified[1]. In this study a delayed response to early reports of rubella by Riyadh health officials led to the occurrence of the second wave of the outbreak in Makkah.

Propagating rubella outbreaks of this kind can be prevented. All SFTC cadets should have been immediately vaccinated against MMR when the first index had been identified. The goal of the rubella vaccination program is to prevent congenital rubella infection[2]. All girls aged 10-14 years, and all rubella-susceptible females of childbearing age should continue to receive the rubella vaccine[3]. Medical military services should vaccinate cadets against MMR and other routine childhood diseases. This age group was not covered under the mandatory vaccination laws begun in 1983. Moreover, these cadets often come from rural areas where exposure to the natural infection is sporadic.

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Mark your calendar . . .

Outside the Kingdom

July 1-10, 1996: Measuring Our Scourges, The History of Epidemiology at the International School of the History of Biomedical Sciences, Centre des Pensieres, Annecy, France. Applications should be sent by May 31, 1996 to:Institut Louis Jeantet d'Histoire de la Medecine, CMU, Case postale, 1211 Geneve 4, Switzerland..Tel. 41-22-702.57.90, Fax 41-22-702.57.92. E- mail: Fantini@CMU.unige.ch.

August 27-30, 1996: The 14th International Scientific Meeting of the International Epidemiological Association--Changing Environment and Global Health Issues. Contact Secretariat of the 14th International Scientific Meeting of IEA, c/o Department of Preventive Medicine, Nagoya University School of Medicine, 65 Tsurumai-cho, Showa-ku, Nagoya 466, Japan. (81)52-733-6729 (fax).

September 3-5, 1996: International Association of Cancer Registries, 30th Annual Meeting. Edinburgh, Scotland. Contact: Jean Connor, Scottish Cancer Registry, Information & Statistics Division, Trinity Park House, Edinburgh, Scotland, EH5 3SQ, Tel.(44) 0131 551-8903, Fax (44) 0131 551-1392.

Inside the Kingdom

November 26-28, 1996: Saudi Society of Family and Community, Jizan Branch, The 3rd Scientific Conference on Primary Health Care in Saudi Arabia & the Obstacles for the Optimal Implementation. Tel (07)317 0695.

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Selected notifiable diseases by region, July-December

	Riyadh	Jeddah	Makkah	Madinah	Taif	Asir	Gizan	Najran	Al Baha	Eastern	Al Ahsa	Tabuk	Al Jouf	Goriat	Arar	Hail	Qassim	Hafr al-Batin	Bisha
Measles	53	375	31	121	36	137	23	1	46	20	37	101	5	1	1	53	69	18	4
Mumps	146	235	75	62	19	70	14	12	15	91	15	24	10	15	6	26	43	31	4
Rubella	37	94	1	9	7	22	0	1	0	21	4	2	0	1	1	1	11	3	0
Varicella	2224	1595	169	289	354	1413	164	249	86	3432	1384	290	136	100	69	180	447	189	112
Brucellosis	362	84	40	82	95	592	46	77	14	47	56	9	19	8	19	249	382	125	233
Meningitis, mening.	3	0	2	6	0	0	0	0	0	3	3	1	0	1	0	0	1	0	1
Meningitis, other	31	17	6	7	6	2	11	0	0	5	5	1	0	1	0	7	7	5	0
Hepatitis A	153	114	27	86	9	292	49	188	9	105	73	29	39	5	7	5	75	57	34
Hepatitis B	244	540	112	36	8	147	13	17	125	249	59	32	1	1	6	10	49	19	20
Hepatitis, unspecified	135	469	131	9	0	120	86	12	106	5	29	44	0	0	5	73	6	12	0
Typhoid & paratyphoid	47	18	14	7	0	15	2	5	1	24	8	4	0	0	0	6	2	4	6
Shigellosis	79	228	0	38	0	4	27	61	0	170	14	53	0	0	0	0	4	58	0
Salmonellosis	362	222	4	5	0	14	11	37	24	867	41	75	0	0	1	0	19	0	2
Amoebic dysentery	47	2855	3	18	120	788	109	7	0	72	14	39	0	4	0	198	16	0	5
Syphilis	16	115	7	0	0	5	3	4	4	26	20	0	0	2	0	0	0	1	4
VD, other	22	416	0	0	0	8	56	3	5	51	68	0	0	14	0	0	0	5	5

Comparison of selected diseases, 1994-1995

	Jul-Dec 1995	Jul-Dec 1994	Jan-Dec 1995	Jan-Dec 1994
Diphtheria	1	1	1	1
Pertussis	13	7	33	14
Tetanus, neonatal	9	20	25	33
Tetanus, other	4	3	14	16
Poliomyelitis	0	1	3	1
Measles	1132	592	2574	1253
Mumps	913	1040	1601	2278
Rubella	215	257	385	610
Varicella	12882	13686	35244	31708
Brucellosis	2668	2238	5997	4929
Meningitis, mening.	17	15	58	30

	Jul-Dec 1995	Jul-Dec 1994	Jan-Dec 1995	Jan-Dec 1994
Meningitis, other	111	167	261	377
Hepatitis A	1356	1372	2697	2485
Hepatitis B	1688	1938	3031	3826
Hepatitis, unspecified	584	1284	1487	2582
Typhoid & paratyphoid	163	296	335	564
Shigellosis	735	473	1223	844
Salmonellosis	1684	1077	2973	1723
Amoebic dysentery	4295	2307	5949	4353
Syphilis	207	242	386	511
VD, other	653	612	961	1129

Diseases of low frequency (July-December 1995)

Pertussis:13 (Jeddah 4, Asir 3, Qassim 2, Gizan 2, Bisha 1, Makkah 1)
Tetanus neomatal: 9 (Makkah 3, Jeddah 3, Gizan 2, Madinah 1)
Tetanus other: 4 (Jeddah 2, Riyadh 1, Baha 1)

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