

Measles and rubella in Croatia

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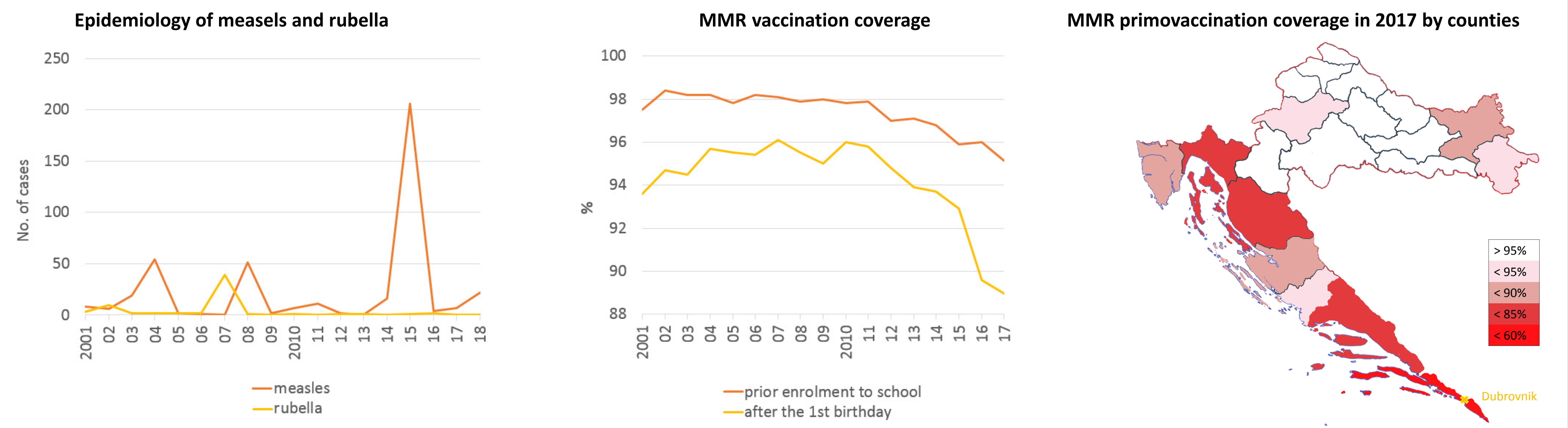
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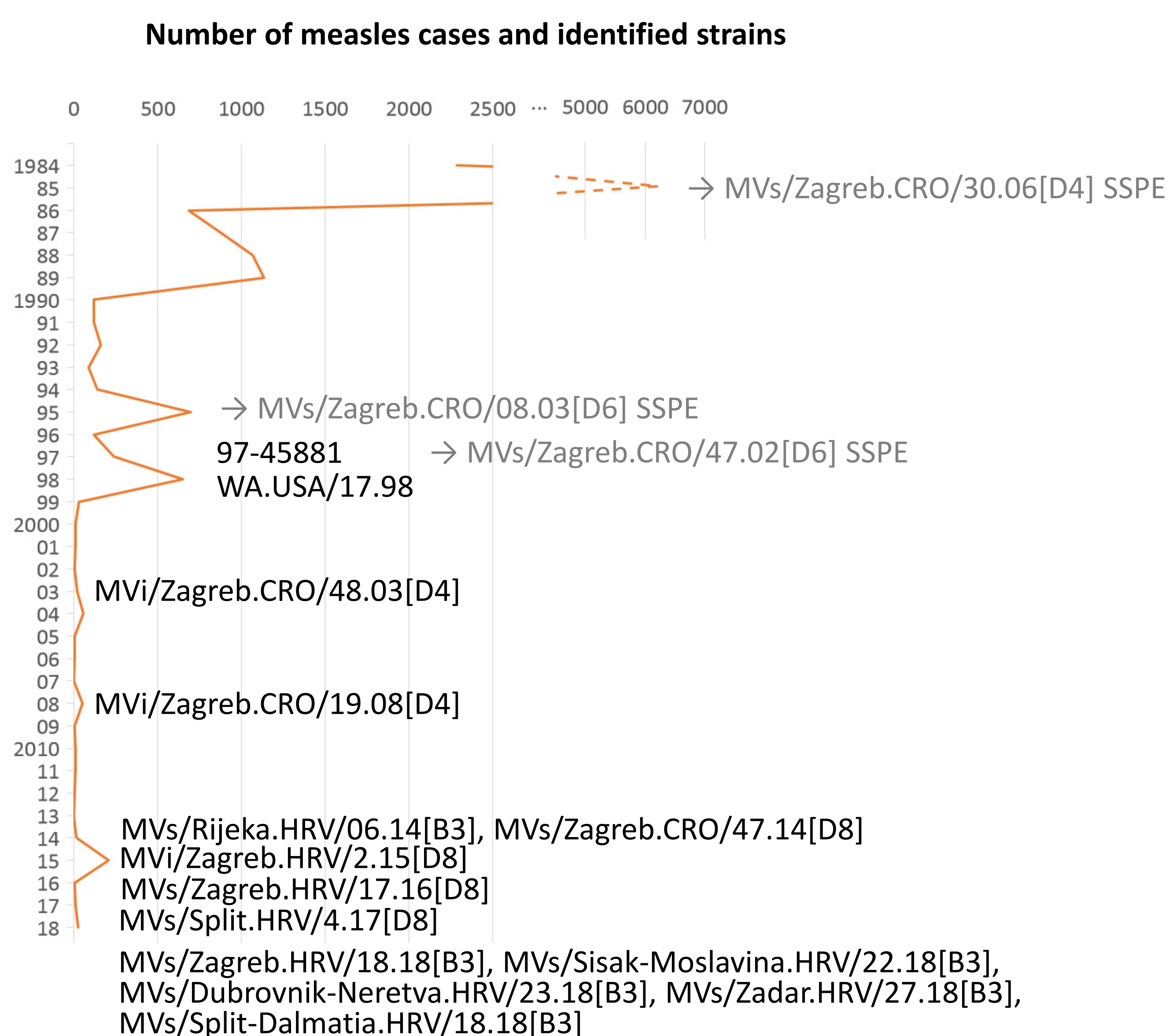
Epidemiology and immunisation status

Measles vaccination was first introduced in the national childhood vaccination schedule in Croatia in 1968. In 1976, it was replaced by the combined measles, mumps and rubella (MMR) vaccine. The MMR vaccination is mandatory, the first dose is administered after the first birthday, the second prior to enrolment to primary school (age 6 or 7).

In the last two decades, less than 10 measles cases have been reported annually, with the exception of four imported-related outbreaks (2003-2004, 2008 and 2014-2015 and 2018). Regarding rubella, only sporadic cases were reported with an outbreak in 2007. There was no reported congenital rubella syndrome. A seroepidemiological study conducted from 2005-2009 showed that 94.6% of childbearing-aged women are immune to rubella.



Molecular epidemiology of measles in Croatia (@ Institute of Immunology and University of Zagreb)



Measles outbreak in Dubrovnik (May-June 2018)

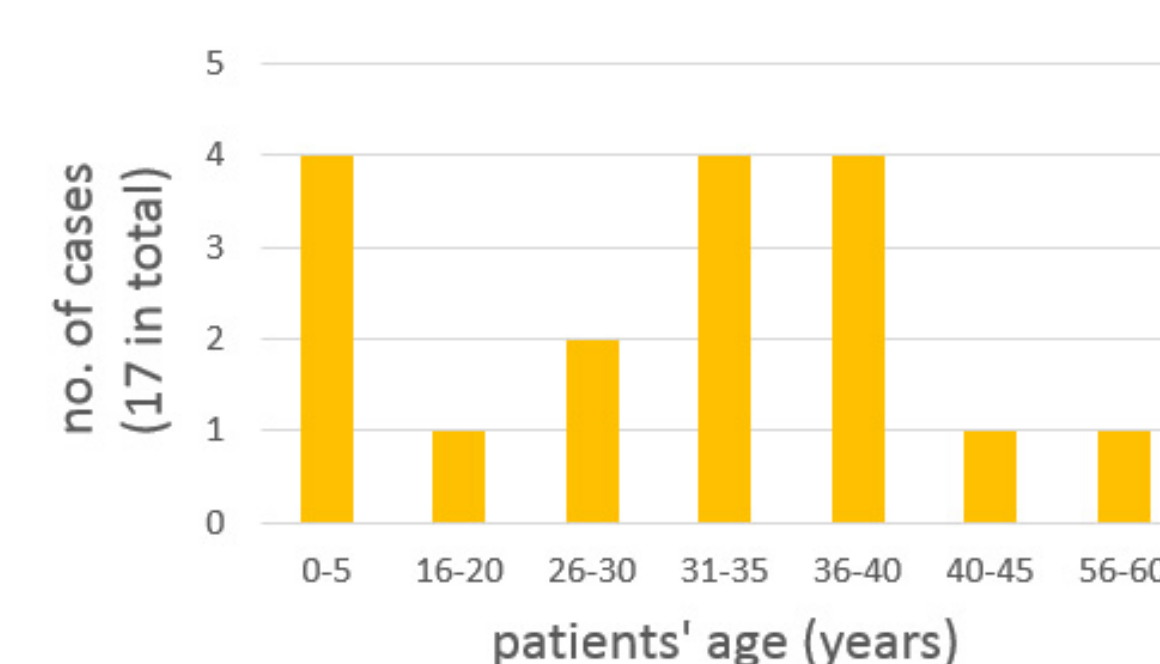


In Croatia, the lowest MMR vaccination coverages are traditionally reported in Dubrovnik-Neretva County, an important tourist destination. In 2017, vaccination coverage for the first dose of MMR vaccine (at age 1) was 89% at the national level, and 56% for this region.

From May 19, 2018, an adult non-vaccinated resident of Dubrovnik-Neretva County who had recently travelled to Kosovo sought care from health care facilities in Dubrovnik, before developing a rash on May 24. The illness was laboratory confirmed as measles by RT-PCR and serology, detected strain belonged to B3 genotype (MVs/Dubrovnik-Neretva.HRV/23.18[B3]).

Besides the index case 16 confirmed cases were reported, 4 were health care professionals. The youngest patient was an 8 month-old infant. Vaccination status was unknown for 10 cases, 3 were non-vaccinated (ages 0, 1, and 2), 2 were vaccinated with 2 doses (ages 18 and 35) and 1 (age 3) with 1 dose. Symptom onset ranged from May 19 to June 15, 2018. The outbreak triggered the catch-up campaign in which 898 children received vaccination.

During this outbreak and unrelated to it, few other imported measles cases were detected in other Croatian cities. They were caused by different strains (except for MVs/Sisak-Moslavina.HRV/22.18[B3]) and did not lead to secondary cases.



Measles samples tested at National Measles/Rubella Laboratory, 2016-2018 (@ Croatian Institute of Public Health)

	RT-PCR ^a				Serology ^{b,c}
	throat swab (tested/positive)	urine (tested/positive)	blood (tested/positive)	total (tested/positive)	serum (tested/positive)
2016	8/2	12/3	3/0	23/5	50/30
2017	7/4	14/3	7/2	28/9	3/2
2018	63/19	61/11	7/1	131/31	25/2

^ain some cases multiple samples from same patients were tested

^bin some cases paired serum samples were tested

^call samples were tested for rubella as well, and all were negative

IgG immunity testing in Dubrovnik-Neretva County (in 2018, during or after the outbreak)

serum (tested/positive, %)
568/453, 79.7