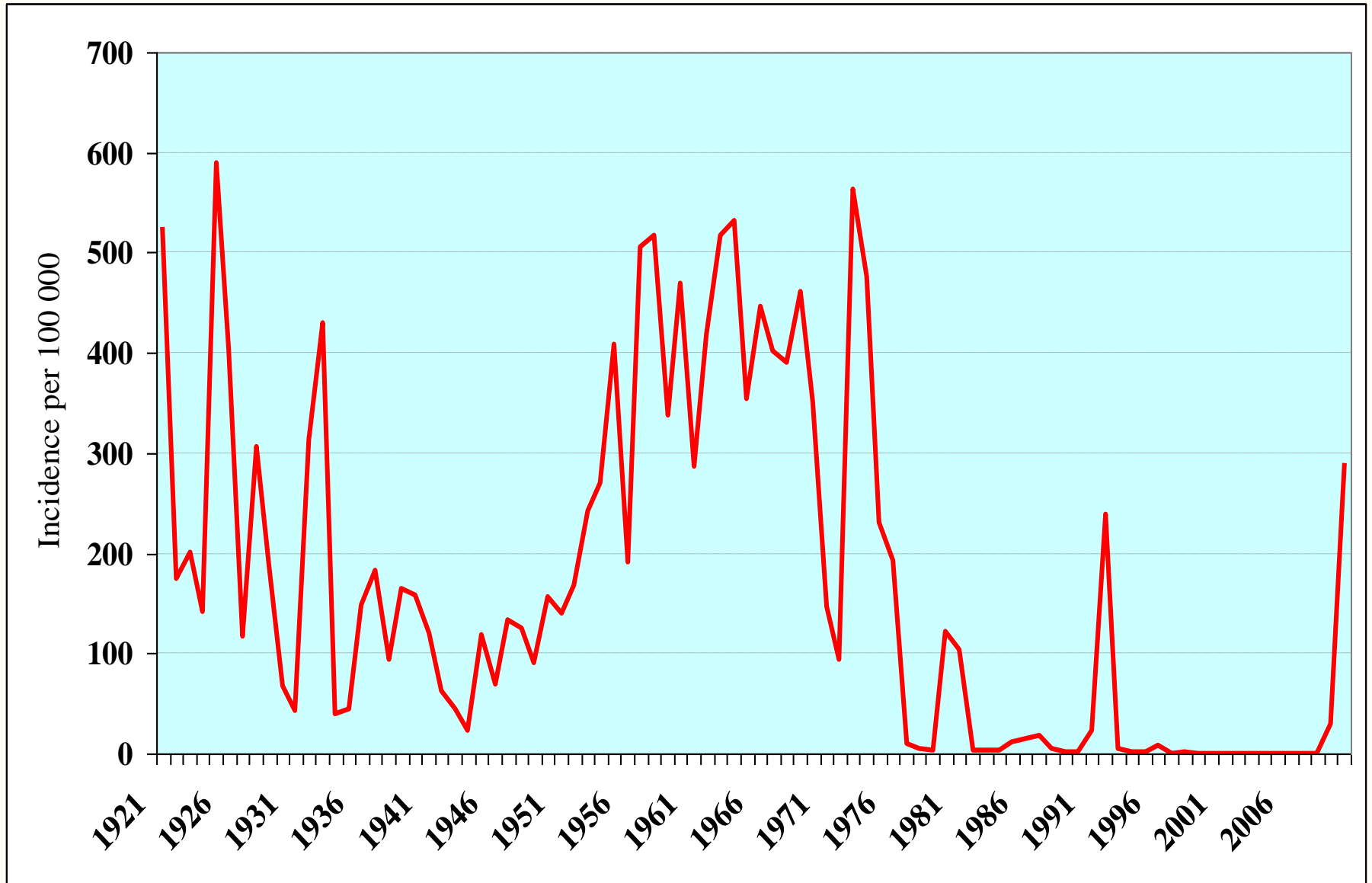


MEASLES OUTBREAK IN BULGARIA, 2009-2010

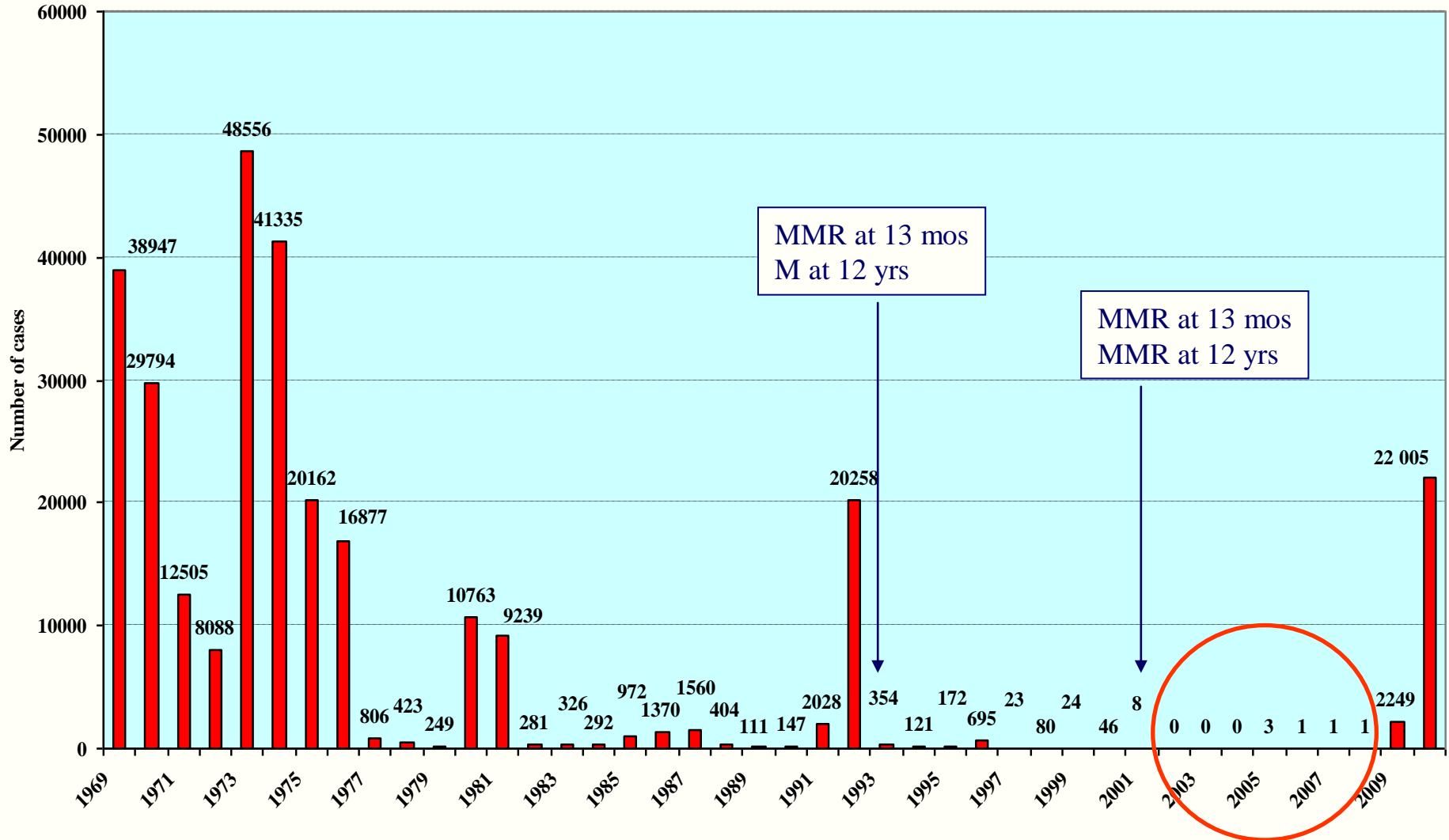


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MEASLES INCIDENCE IN BULGARIA, 1921-2010



MEASLES INCIDENCE IN BULGARIA AFTER THE INTRODUCTION OF IMMUNIZATION IN 1969



MEASLES EPIDEMICS IN BULGARIA

Year	1980	1981	1982	1991	1992	1993	2009	2010
Number of cases	10 763	9 239	281	2 028	20 258	354	2 249	22 005
Incidence per 100,000	121.45	103.74	3.15	22.6	239.1	4.17	29.6	290.9

THE 2009 MEASLES OUTBREAK IN BULGARIA

- The outbreak started as a family cluster in the North-Eastern part of the country as a result of importation:
 - The index case became ill on 12 March, 2009, four days after arrival from Hamburg, where he works
 - The subsequent four measles cases occurred among his close contacts (3 family members and 1 neighbor)
 - All of cases were laboratory confirmed and the virus was identified as measles genotype D4 in the WHO RRL for Measles and Rubella in Berlin

THE 2009 MEASLES OUTBREAK IN BULGARIA

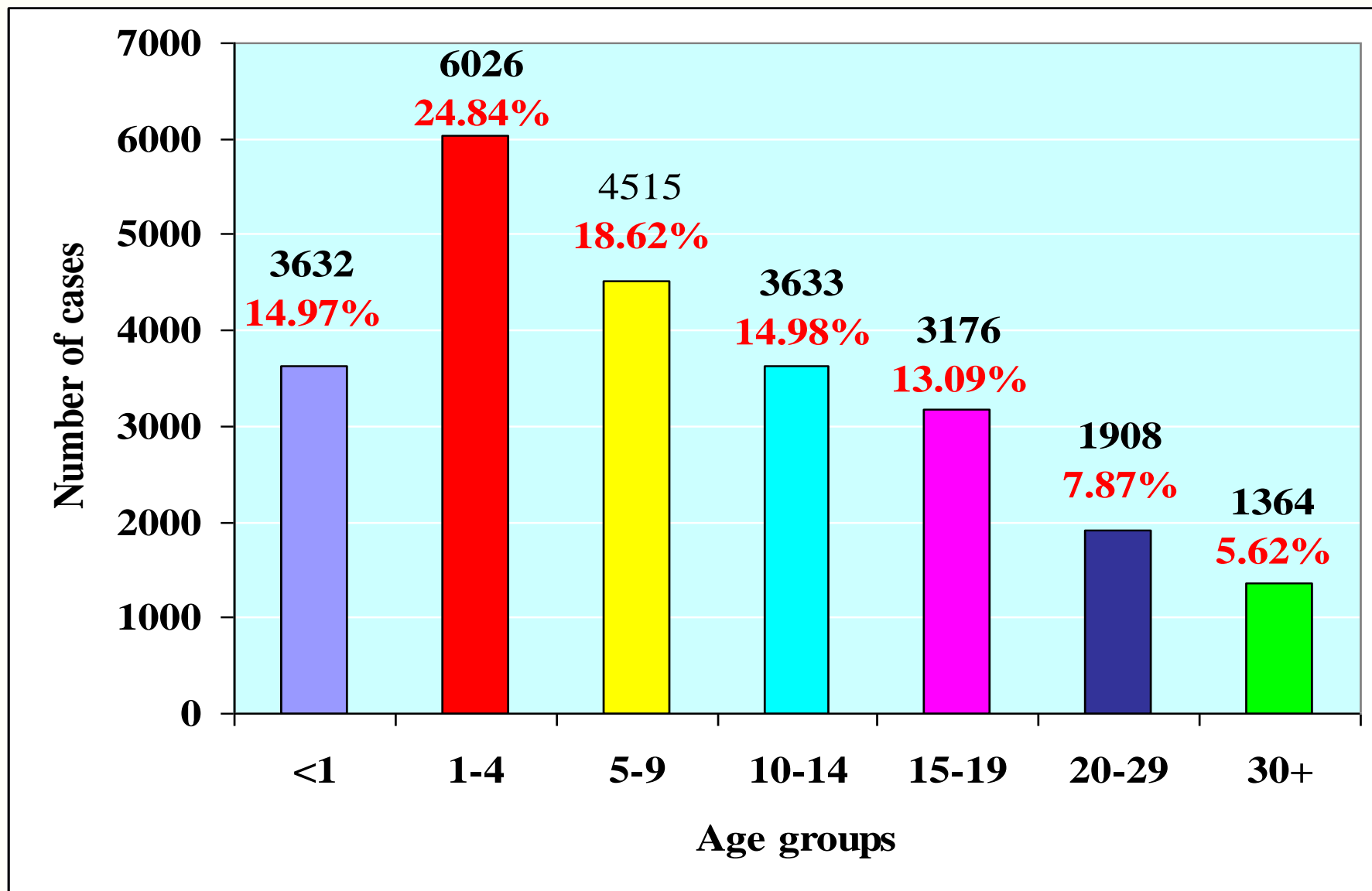
- Index case was classified as imported and all following cases were local cases
- From the beginning of the outbreak in March 2009 until 31 December, 2009, a total of 2 249 cases and 7 deaths were reported
- In 2010, there were 22,005 reported measles cases from all regions in Bulgaria and 17 deaths
- From the beginning of the outbreak until 31 December, 2010, a total of 24 254 cases and 24 deaths were reported

POPULATION MOSTLY AFFECTED DURING THE MEASLES EPIDEMIC IN BULGARIA

An informal communication from the Regional Inspectorates about the ethnic origin of measles patients in Bulgaria in 2009-2010 is showing that in average 89.3% from all cases were in Roma people, varying from 38.9% in one of the regions to 100% in another one.

	Total number	Number of Roma people	%
Measles cases	24 047	21 470	89.3
Deaths	24	22	91.7

AGE SPECIFIC DISTRIBUTION OF A TOTAL OF 24, 254 MEASLES CASES IN BULGARIA, 2009-2010



VACCINATION STATUS OF 24,137 MEASLES CASES REPORTED IN BULGARIA IN 2009-2010

Number of vaccine doses	Number of cases by age groups							Total
	≤ 1	1-4	5-9	10-14	15-19	20-29	30+	
0	3429	1876	525	334	297	133	86	6 680 27.7%
1	1	1886	1964	1226	514	84	36	5 711 23.7%
2	0	104	181	312	506	74	14	1 191 4.9%
No data	183	2135	1820	1746	1839	1607	1225	10 555 43.7%
Total	3 613	6 001	4 490	3 618	3 156	1 898	1 361	24 137

NATIONAL COVERAGE WITH MMR VACCINE IN BULGARIA, 2001-2009

Year	VACCINE COVERAGE (%)								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
MMR at 13 mos	90.1	92.1	95.5	94.7	96.2	95.7	96.0	95.9	96.1
MMR at 12 yrs	68.8	79.2	89.4	90.8	92.4	93.3	94.0	94.3	92.8

According to the WHO recommendations vaccination coverage with two doses of measles vaccine must be :

- national coverage $\geq 95\%$
- regional coverage $\geq 90\%$.

SERO-SURVEY IN BURGAS HOSPITAL

SEPTEMBER-DECEMBER, 2008

Age (years)	Number of tested persons	Ig G positive	
		Number	%
0	8	1	12.5
1-4	35	26	74.3
5-9	28	22	78.6
10-14	31	26	83.9
15-19	34	24	70.6
20-24	35	29	82.9
25-29	29	25	86.2
30-34	22	19	86.4
35-39	14	13	92.9
40+	13	13	100.0
Total	249	198	79.5 74.5%-84.5% (CI 95%)

PERCENTAGE MEASLES SERONEGATIVE (ANTIBODY TITRE < 0.15 IU/ML) BY AGE GROUP IN BULGARIA, COMPARED TO WHO TARGETS

As part of the European Sero-Epidemiology Network 2 (ESEN2), Bulgaria collected national serum bank between 1996 and 2004.

Age	Measles seronegative (%)				
	2–4 years	5–9 years	10–19 years	20–39 years	40+ years
WHO target	< 15	< 10	< 5	< 5	< 5
Bulgaria	30.4	25.9	20.7	10.1	9.0

Andrews N, Tischer A, Siedler A, Pebody RG, Barbara C, Cotter S, Duks A, Gacheva N, Bohumir K, Johansen K, Mossong J, Ory F, Prosenk K, Sláčiková M, Theeten H, Zarovou M, Pistol A, Bartha K, Cohen D, Backhouse J, Griskevicius A. **Towards elimination: measles susceptibility in Australia and 17 European countries.** Bull World Health Organ. 2008 Mar;86(3):197-204.

CONCLUSION

1. The current measles epidemic is the most intensive one in Bulgaria after the 1973-1974 epidemic (a total of 89 891 cases, 26 deaths)
2. Bulgaria was at risk of measles epidemic and the main risk factors were:
 - Vaccine coverage with two doses MMR lower than the recommended by WHO at both national and regional level
 - Proportion of susceptible to measles persons exceeding the WHO susceptibility targets for the respective age groups
 - Concentration of susceptible to measles persons in some sub-population groups “pockets of under-immunised population”, in this case specifically Roma population

LESSONS LEARNED

The approach to a better measles control in Bulgaria should be focused on:

- Increasing the coverage ($> 95\%$) with two doses of MMR vaccine through the routine immunisation programme
- Conducting seroepidemiological studies in order to identify the non-protected groups on time
- Organising catch-up campaigns to address identified susceptible population groups/cohorts
- Strengthening measles surveillance and vaccine coverage monitoring
- Improving the communications – with the general public, with medical specialists and with the most vulnerable Roma people (the role of Health mediators in Bulgaria)