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Vaccine-preventable Diseases and Immunization Programme
Division of Health Programmes

Summary of Discussions and Recommendations of the 13th Informal Consultation on the Global Polio Laboratory Network

An informal consultation of the global polio laboratory network (GPLN) was held at WHO/HQ, Geneva, Switzerland, from 28 to 29 June 2007. The network has expanded from 145 to 146 laboratories following the recent inclusion of the Instituto Nacional de Salud laboratory, Chile. Participants at the consultation represented 27 network laboratories, six WHO regions and WHO/HQ. The network's activities in support of polio eradication were reviewed, including evidence for transmission of wild and Sabin vaccine-derived polioviruses (VDPVs), timeliness of reporting and laboratory quality assurance. The informal consultation was preceded by a one day small working group discussion among 14 participants (representing seven global specialized laboratories, WHO/HQ and WHO regional offices for Europe and the Eastern Mediterranean) that focused on the development and evaluation of new molecular-based laboratory procedures and reagents for more rapid poliovirus detection.

In 2006, the GPLN tested approximately 137,000 faecal samples from cases of acute flaccid paralysis (AFP) and confirmed wild poliovirus transmission in 17 countries. Endemic serotype 1 and 3 polioviruses were transmitted in four countries (Afghanistan, India, Nigeria, and Pakistan). Analysis of VP1 nucleotide sequences of virus isolates showed that imported viruses of Nigerian origin were transmitted in eight countries (Cameroon, Chad, Ethiopia, Indonesia, Kenya, Niger, Somalia and Yemen). Imported viruses of Indian origin were transmitted in an additional five countries (Angola, Bangladesh, Democratic Republic of Congo, Namibia and Nepal). In 2007, imported poliovirus has also been detected in Myanmar. The majority of importations were due to polioviruses of serotype 1. Single case importations of serotype 3 viruses occurred in 2006 in Cameroon, Chad and Niger (two separate episodes).

Between January 2006 and June 2007, VDPVs were isolated from acute flaccid paralysis (AFP) cases in Guangxi-China, Myanmar and Nigeria; from a healthy child in Shanghai-China; from sewage waters in Israel and the Czech Republic; and from immunodeficient persons in Egypt, Iran, Syria and Tunisia (the case was diagnosed in France). Data from the GPLN suggest that the current screening approach for detection of VDPVs of serotypes 2 and 3 is inadequate. There is urgent need to address this issue to increase VDPV detection sensitivity. In the interim, systematic analysis of surveillance data to monitor for trends in geographical and temporal clustering of AFP cases with Sabin isolates of the same serotype has proven to be a useful complement to laboratory-based screening to flag programmatically important Sabin strains for more detailed genetic characterization.

The performance of network laboratories is monitored through a laboratory accreditation programme that is administered by the World Health Organization (WHO). Elements of the programme are proficiency testing, on-site performance reviews conducted at least once every three years by expert virologists, and on-going monitoring of accuracy and timeliness of reporting. Ninety-four percent of network laboratories were fully accredited in 2006. The main performance deficiency for eight provisionally accredited laboratories was delayed referral of isolates for intratypic differentiation. One non-accredited laboratory is testing samples in parallel with an accredited reference laboratory until its performance weaknesses are corrected. Updated accreditation data was not received for two laboratories in 2006.

Rapid confirmation of transmission of wild polioviruses and VDPVs is an essential first step towards implementing interventions to prevent virus spread. The GPLN has developed a strategic plan to decrease laboratory reporting times without compromising poliovirus detection sensitivity. Key elements of the plan include introducing a new test algorithm that has been proven through field evaluation in 3 locations to reduce reporting times by 50% without compromising poliovirus detection sensitivity; increasing the number of facilities with on-site capacity for virus isolation and ITD thereby decreasing the need for inter-country shipment of virus isolates for analysis; and developing new diagnostic procedures and reagents.

Priority is being given to implementing the new test algorithm in remaining polio endemic regions (Africa, Eastern Mediterranean and South East Asia). As of June 2007, 42 of 43 laboratories in these regions had already switched to using the new test algorithm, and 18 of these laboratories have on-site capacity for both virus isolation and ITD. Work has begun towards staff training and improving the infrastructure of an additional nine laboratories to upgrade them to perform ITD tests by December 2007. The main operational challenges with using the new test algorithm have proven to be increased workload and costs of ITD tests, and ensuring that sufficient ELISA reagents are available to meet demands. The mean time for completing laboratory analyses in 2006 was approximately 36, 32 and 21 days in the regions of South East Asia, Africa, and Eastern Mediterranean, respectively; compared to equivalent reporting times of 31, 31 and 16 days in the first 3 months of 2007.

Adjustments are being made to the GPLN's accreditation and quality assurance programme in line with requirements of the new test algorithm: revision of the WHO polio laboratory manual is already under-way; laboratories will be expected to meet new targets for reporting times starting in January 2008; and, new proficiency test panels are being prepared to evaluate performance.

The GPLN is already looking to the poliovirus surveillance needs of the future. In this regard, enterovirus surveillance was discussed as one non-AFP based approach that can be evaluated in polio-free areas to assess relevance and comparative sensitivity to AFP surveillance.

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Table 1. AFP/Polio Weekly Reporting European Region (all countries), 2007					
Country	**Polio Compatible Cases**	**% Completeness of Reporting**	**Week of Last Report**	**Method of Reporting**	**Country Using "Priority" Coding**
Albania	0	93%	30	email	yes
Andorra*	0	93%	30	direct web entry	-
Armenia	0	56%	23	email	yes
Austria	0	100%	30	direct web entry	yes
Azerbaijan	0	93%	28	email	yes
Belarus	0	100%	30	direct web entry	yes
Belgium	0	100%	30	direct web entry	-
Bosnia and Herzegovina	0	70%	26	email	partial
Bulgaria	0	93%	30	direct web entry	yes
Croatia*	0	80%	24	direct web entry	yes
Cyprus	0	100%	30	direct web entry	yes
Czech Republic	0	66%	29	email	
Denmark	0	0%		DNR	-
Estonia	0	100%	30	direct web entry	yes
Finland	0	0%		DNR	-
France	0	0%		DNR	-
Georgia	0	93%	30	email	yes
Germany	0	96%	30	email	yes
Greece	0	96%	30	direct web entry	partial
Hungary	0	96%	30	direct web entry	yes
Iceland	0	0%		DNR	-
Ireland	0	96%	29	direct web entry	yes
Israel	0	93%	30	email	yes
Italy	0	96%	30	direct web entry	yes
Kazakstan	0	86%	30	email	yes
Kyrgyzstan	0	40%	29	email	yes
Latvia	0	100%	30	direct web entry	yes
Lithuania	0	96%	30	direct web entry	yes
Luxembourg	0	0%		DNR	-
Malta*	0	63%	26	email	yes
Monaco	0	0%		DNR	-
Montenegro	0	60%	30	email	-
Netherlands	0	0%		DNR	-
Norway	0	100%	30	direct web entry	yes
Poland	0	100%	30	direct web entry	yes
Portugal	0	80%	24	email	partial
Republic of Moldova	0	93%	30	direct web entry	yes
Romania	0	100%	30	email	partial
Russian Federation	0	86%	30	direct web entry	yes
San Marino	0	0%		DNR	-
Serbia	0	96%	30	email	partial
Slovak Republic	0	96%	30	direct web entry	yes
Slovenia*	0	100%	30	direct web entry	-
Spain	0	96%	30	direct web entry	yes
Sweden	0	73%		DNR	-
Switzerland	0	100%	30	direct web entry	yes
Tajikistan	0	90%	30	email	yes
T.F.Y.R.Macedonia	0	86%	30	email	no
Turkey	0	96%	30	email	yes
Turkmenistan	0	90%	30	email	yes
Ukraine	0	73%	30	email	yes
United Kingdom	0	0%		DNR	-
Uzbekistan	0	90%	28	email	yes
Average/Totals	0	87%			

Shaded country name indicates country classified as endemic / recently endemic by the Regional Certification Commission in 1996.

* No AFP cases reported to WHO Regional Office for Europe.

DNR-do not report AFP surveillance data.

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TABLE 2. AFP Reporting - European Region, Countries with AFP Surveillance, 2006-2007

Country	2006 (Weeks 1 - 52)			2007 (Weeks 1 - 30)					
	Non-Polio AFP Rate*	% With 2 Stool Specimens. **	Surveillance Index***	Number of AFP Cases	Number of Cases Pending §	Number of Cases Priority Pending §§	Non-Polio AFP Rate*	% With 2 Stool Specimens**	Surveillance Index***
Albania	0.36	**100%**	0.36	5	0	0	**1.03**	**100%**	**1**
Andorra	0	0%	0	0	0	0	0	0%	0
Armenia	0.33	50%	0.33	6	0	0	**1.46**	60%	0.8
Austria	0.72	56%	0.48	1	0	0	0.14	**100%**	0.14
Azerbaijan	0.86	**94%**	**0.81**	16	6	0	**1.31**	**100%**	**1**
Belarus	**2.73**	**92%**	**0.92**	35	0	0	**4.22**	**94%**	**0.97**
Belgium	0.35	17%	0.06	2	1	0	0.19	0%	0
Bosnia and Herzegovina	0.63	**100%**	0.63	0	0	0	0	0%	0
Bulgaria	**1.83**	**84%**	**0.84**	8	4	0	**1.32**	**100%**	**1**
Croatia	0	0%	0	1	0	0	0	0%	0
Cyprus	**1.83**	67%	**1**	1	0	0	**1.04**	0%	0
Czech Republic	**1.03**	**87%**	**1**	6	0	2	0.7	**100%**	0.7
Estonia	0.51	**100%**	0.51	0	0	0	0	0%	0
Georgia	**1.11**	**100%**	1	8	0	0	**1.71**	75%	0.75
Germany	0.55	44%	0.3	34	1	1	0.5	41%	0.31
Greece	**1.2**	74%	0.74	5	0	0	0.53	60%	0.32
Hungary	0.96	40%	0.58	4	0	0	0.44	25%	0.44
Ireland	**1.06**	22%	0.56	1	0	0	0.2	0%	0
Israel	0.9	6%	0.58	6	0	0	0.52	0%	0.26
Italy	0.64	65%	0.44	41	7	0	0.85	56%	0.6
Kazakhstan	**1.5**	**94%**	**0.96**	31	0	0	**1.59**	**94%**	**0.97**
Kyrgyzstan	**1.7**	**96%**	**1**	17	5	0	**1.75**	**100%**	**1**
Latvia	0.92	**100%**	0.92	1	0	0	0.53	**100%**	0.53
Lithuania	**2.36**	46%	**0.85**	3	0	0	0.95	67%	**0.95**
Malta	0	0%	0	0	0	0	0	0%	0
Montenegro	**1.58**	**100%**	**1**	0	0	0	0	0%	0
Norway	**1.22**	27%	0.73	3	2	0	0.56	33%	0.38
Poland	**1.08**	71%	0.82	24	0	1	0.67	38%	0.39
Portugal	0.3	60%	0.24	4	4	0	0.4	25%	0.2
Republic of Moldova	0.81	**83%**	0.68	13	0	0	**3.06**	**92%**	**0.92**
Romania	**1.16**	**95%**	0.95	17	0	0	0.88	**82%**	0.78
Russian Federation	**1.93**	**90%**	**0.92**	250	66	22	**1.96**	**92%**	**0.94**
Serbia	**1.16**	**86%**	**1**	6	1	1	0.58	**83%**	0.48
Slovakia	0.23	**100%**	0.23	5	0	0	0.98	60%	0.79
Slovenia	0	0%	0	0	0	0	0	0%	0
Spain	0.67	43%	0.4	24	0	0	0.63	50%	0.5
Switzerland	**1.19**	7%	0.14	5	0	0	0.58	25%	0.15
Tajikistan	0.83	**100%**	**0.83**	28	2	0	**1.87**	**96%**	**0.96**
T.F.Y.R.Macedonia	0.77	**100%**	0.77	1	0	0	0.44	0%	0.44
Turkey	0.9	**84%**	0.77	136	23	4	**1.06**	**85%**	0.88
Turkmenistan	**1.25**	**95%**	**0.95**	17	1	0	**1.91**	**82%**	**0.82**
Ukraine	**1.89**	**94%**	**0.95**	68	10	3	**1.79**	**96%**	**0.97**
Uzbekistan	**1.15**	**99%**	**0.99**	58	14	1	**1.13**	**98%**	**0.98**
Average/Totals	**1.13**	**81%**	**0.86**	891	147	35	0.69	**83%**	0.61
Recently Endemic	**1.34**	**91%**	**0.93**	677	128	31	0.87	**91%**	0.81

*Annualized rate per 100 000 children under the age of 15 years. **Bold** = meeting WHO target of 1.0.

Two stool specimens collected at least 24 hrs. apart within 14 days of onset of paralysis and adequately shipped to the laboratory. **Bold = meeting WHO target of 80%.

***Index = non-polio AFP rate up to 1.0 x (% first adequate specimens), **Bold** ≥ 0.8

§ Total number of AFP cases pending final classification 90 days after Date of onset.

§§ Number of AFP cases assigned a priority coding and pending.

All indicators are calculated year to date unless specified otherwise.

Website: http://www.euro.who.int/vaccine CISID: http://data.euro.who.int/cisid Contact: polio@euro.who.int

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