



POLIO LAB NETWORK

Quarterly Update



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Children are infected through discarded materials

Eight children, age's 11-14 years, were hospitalized with high fevers and skin eruptions after playing with expired smallpox vaccine. The children had sprinkled each other with powder from the discarded glass vials they had found at a garbage dump near a public health station in Vladivostok. This story appeared in the WHO Weekly Epidemiological Record for the week of 23 June 2000 and bears repeating here.

It is relevant to all laboratories, particularly to those laboratories disposing of wild poliovirus infectious and potentially infectious materials.

It is difficult to imagine how anyone might be exposed to wild poliovirus laboratory or clinical materials that have been discarded in the garbage. On the other hand, the person or persons in Vladivostok who dumped the live vaccinia clearly never dreamed of such an improbable

event either. But it happened.

Laboratories are reminded that all infectious and potentially infectious materials should be decontaminated by autoclaving before discarding. Autoclaving fecal material can be a real olfactory challenge in laboratories with no ducts to exhaust the spent steam to the outside. These laboratories may wish to schedule autoclaving of such materials after regular duty hours. Unfortunately, there is no dependable alternative. Liquid disinfectants are not recommended. Nondispersed solids in stool specimens may protect poliovirus from the action of the disinfectant.



News from the Regions: EMR

The Eastern Mediterranean Region (EMR) Polio Laboratory Network continues on its improvement trajectory. All 10 Laboratories are either provisionally (3) or fully accredited. This laudable achievement was made possible by the impressive performances of the Iraq and Sudan Laboratories, neither of which were accredited last year. All Laboratories in the Network have fully functional computerized databases with access to email for rapid electronic transfer of reports. This facilitates weekly reporting of laboratory data, which was initiated in June of last year. All wild poliovirus isolates from the Region are being genetically characterized to ensure authenticity, provide data relevant to immunization and surveillance activities, or to investigate suspected importation of wild viruses into polio free countries.

Laboratory management has been strengthened through additional training, with particular emphasis being placed on improving the quality of documentation of laboratory processes, equipment maintenance, and projecting resource needs. As further insurance that work is not disrupted through a shortage of resources, the Regional Office has estab-

(Continued on page 3)

In This Issue:

Children are infected through discarded materials	1
News from the Regions: EMR	1
The new isolation and typing PT scoring system is evaluated	2
Poliovirus Surveillance Report, January - March 2000	4

The new isolation and typing PT scoring system is evaluated

The introduction of L20B cells into the Laboratory Network brought with it major changes in the WHO standard procedures for poliovirus isolation and identification. The recommended scheme was published in the *Polio Lab Network, Quarterly Update, IV, No. 4, 1998*. In brief, chloroform-treated stool suspensions are inoculated on L20B and RD cells. Because characteristic CPE in L20B cells is highly indicative of polioviruses, such isolates are typed immediately on L20B cells without concern for interference by other enteroviruses that may be present in the same suspension. Characteristic CPE in RD cells is indicative of polioviruses, other enteroviruses, or mixtures. Such isolates are sub-passaged on L20B cells. If CPE occurs on L20B, the isolate(s) is typed on L20B, as above. If CPE fails to appear on sub-passage from RD to L20B, the presence of polioviruses in the suspension is excluded and a non-polio enterovirus (NPEV) is reported. (Note that high concentrations of some NPEVs in RD will produce CPE when sub-passaged on L20B). NPEV isolates may be typed if required by the laboratory mission, but typing is not required for the WHO poliovirus Network. The focus of the scheme is on the primary objective of the Network, finding and correctly typing polioviruses in positive samples. The new scoring system for the annual proficiency test (PT) is based on that objective.

The major differences between the old and new scoring systems are listed in Table 1. The programmatic importance of correct isolation and typing is reflected in the higher scores awarded for finding the correct polioviruses in the correct samples, and the more severe punishment for poliovirus cross contamination. Enterovirus detection and characterization is de-emphasized in accord with the Network objectives.

Some examples of scoring an imaginary PT by both systems are given in Table 2. In some cases, the higher score results from the old scoring system, in other cases, from the new system.

The effects of the two systems on end scores may be seen in the results from PTs performed by 48 European Laboratories in 1998 and

1999 (Table 3). The mean scores for the 2 years were very similar with either the old or new systems (86.3%/92% in 1998 versus 85.3%/85.9% in 1999). However, in 1998, 10 more Laboratories achieved a passing score of 80% under the new system than under the old. In 1999, only 4 did. The reason is that most mistakes in 1998 were incorrect NPEV typing, while in 1999 the big mistakes were poliovirus cross contamination, incurring heavy penalties.

Some may question the need for any NPEVs in the test panel under the new scoring system, while others may regret the lesser attention being given to these clinically important viruses. The rationale for retaining NPEVs in the test panel is multiple. First, the presence of NPEVs reflects real laboratory experiences. Second, the isolation of NPEVs serves as a test for RD cell sensitivity. Third, it allows those

(Continued on page 3)

Table 1 Proficiency Test Scoring Systems

Basic principles	Old	New
Cells:		
	HEp-2 RD	L20B RD
Typing:		
	Polio by WHO sera	Same
	Entero with RIVM kit	No entero
Scoring:		
Correct result for polio sample	20 points	30 points
Correct result for polio-negative sample	10 points	5 points
Incorrect polioviruses typing	-10 points	-20 points
Contamination with poliovirus	-10 points	-20 points
Contamination with enterovirus	-10 points	-10 points
Enterovirus typing	10 points	0 points

(Continued from page 1)

lished a “buffer stock” of essential cell culture supplies to meet emergency needs.

Of equal importance, but more difficult to express quantitatively, is the sense of teamwork which is evident throughout the EMR Network. Much of this can be attributed to dedicated Laboratory leadership in an enabling environment fostered by the EM Regional office. Meetings of the directors of Network Laboratories have been pivotal annual events for the past four years, providing opportunities for exchange of experiences, technical updates, and priority setting. The ongoing training activities in the Region further strengthen the Network. Training is tailored to meet the needs of the individual Laboratory and may include formal workshops, training fellowships at Regional Reference or Specialized Laboratories, and assignment of consultant virologists to individual Laboratories for periods of up to one month.

Despite all these accomplishments, the EMR Network recognizes the challenge to further reduce the lapse in time between poliovirus isolation/typing and genome characterization. Intensification of eradication efforts in the Region requires enhanced programmatic responses to reports of wild poliovirus detection.



(Continued from page 2)

laboratories that do enterovirus typing for diagnostic or epidemiological purposes to test their abilities. The PT scoring system does not reward this effort, but the results are a clear indication of laboratory proficiency in enterovirus typing.

Independent of exact scores, a non-optimum score in any system indicates the need for careful evaluation of laboratory practices and improvement. Even a perfect score may mask a problem in the laboratory, as PT panels are often given special attention and are an-

alyzed by the most experienced technician. Achieving passing scores in an annual proficiency test is not a goal in itself. Rather, it is an important part of a complete and continuously on-going external/internal quality control system, which includes many other components that ensure reliability and generate confidence in laboratory performance.

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Table 2 Effect of scoring system on individual scores in an imaginary proficiency tests

Sample	Key	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6
1	P1+E4	P1	P1	P1	P1+E4	P1+E4	P1
2	P2+P3	P2+P3	P2+P3	P2+P3	P2+P3	P2+P3	P3
3	E20	NPEV	NPEV	neg	P1	neg	P1
4	P1+E11	P1	NPEV	P1	P1+E11	P1+E11	E11
5	neg	neg	neg	neg	neg	P1	neg
Score							
Old	100%	78%	69%	72%	82%	82%	45%
New	100%	100%	80%	95%	75%	78%	45%

Table 3: Comparison of old and new scoring system on results of the EURO 1998 and 1999 proficiency tests

Year of PT	1998		1999	
	Old	New	Old	New
Scoring system				
Number of labs with passing scores	34/48	44/48	37/48	41/48
Number of labs with non-passing score	14/48	4/48	11/48	7/48
Number of labs with higher score in system	7/48	26/48	8/48	14/48
Mean score	86.3%	92.0%	85.3%	85.9%

Poliovirus Surveillance Report, January - March 2000

National Lab REGION	Number of AFP cases with specimens	POLIOVIRUS TYPING RESULTS						
		P1 only	P2 only	P3 only	NPEV	Enterovirus Mixtures	Negative	Pending
AFR	522 (*1030)	28	7	6	103	6	860	20
AMR	316	2	1	3	20	0	231	59
EMR	567	22	10	21	30	9	469	6
EUR	580 (*1370)	7	3	45	53	11	1006	145
WPR	187	1	5	0	0	2	134	45
SEAR	2052	59	21	83	148	22	1277	442

* Specimen based results

Regional Ref. Lab REGION	No. of isolates/cases submitted	POLIOVIRUS INTRATYPIC DIFFERENTIATION RESULTS						
		Type 1		Type 2		Type 3		Pending
		Wild	Sabin	Wild	Sabin	Wild	Sabin	
AFR	113	8	39	0	34	0	32	0
AMR	6	0	2	0	1	0	3	0
EMR	62**	21	6	0	17	7	16	4
EUR	230	0	59	0	37	0	112	22
WPR	8	0	0	0	0	0	0	8
SEAR	215***	10	38	0	16	37	42	50

** Cases

***Includes 22 vaccine mixtures

AFRO: No wild poliovirus was isolated from any of the Southern and East Africa countries. All eight wild poliovirus strains (type 1) were identified from AFP cases in West and Central Africa (Angola, Benin, Chad, Democratic Republic of Congo, Mali and Niger).

AMRO: No wild polioviruses have been detected in the Americas since a case in Peru detected on 5 September 1991.

EMRO: Wild polioviruses were detected from 28 cases in six countries during the first quarter of 2000; Pakistan (20 – 12 P1 and 8 P3), Egypt (2 – 1P1 and 1 P3), Afghanistan (2 – 1P1 and 1P3) Sudan (3 – all P1), Iraq (4 – all P1) and Somalia (12 – 8 P1 and 4 P3). Wild type 2 poliovirus has not been detected in the Eastern Mediterranean region since 1997

EURO: The last reported case of wild poliovirus detected in the European region had an onset of paralysis on 26 November 1998. Despite intensified surveillance in the region no further cases have been detected.

SEARO: Forty-seven wild polioviruses were detected in the first quarter of 2000 in the South East Asian region. All were identified from India with 10 wild type 1 and 37 type 3 viruses detected, reflecting the continuing type 3 outbreak in the northern Indian states of Uttar Pradesh and Bihar.

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