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Detection and Subtyping of Dengue Fever Virus in Three Countries

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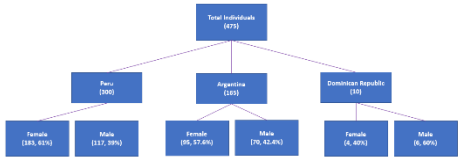
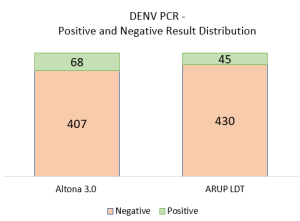
Background: Dengue is a viral disease transmitted by *Aedes aegypti* and *Aedes albopictus* mosquitos already infected by one of four strains (DENV 1 to 4). It is associated with a worldwide death rate of 40 thousand/yr. (esp. Southeast Asia and Latin America). We investigated the presence of DENV and its four subtypes in 475 individuals: 400 adults (147 male, 253 female (100 pregnant, 153 nonpregnant) and 75 children (<21 yr) (48 male, 27 female) from Peru (300), Argentina (165) and Dominican Republic (10).

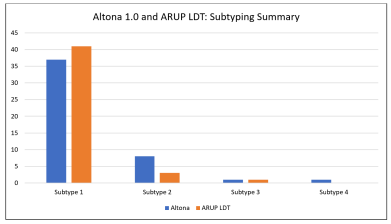


Methods: Febrile subjects with signs and symptoms of DENV infection were enrolled and samples collected upon presentation to the hospital. All subjects were enrolled within 7 days of symptom onset. Specimens were tested for DENV PCR and subtyping (ARUP; Salt Lake City, UT and Altona Diagnostics; Hamburg, Germany).

Results: Of the 86 PCR positive specimens, 77 were also tested by ELISA for NS1 antigen (InBios; Seattle, WA). Altona/ARUP results for 475 tests were as follows: 68/45 positive; 407/430 negative. Altona/ARUP subtyping: 47/45 tests, subtype 1: 37/41; subtype 2: 8/3; subtype 3: 1/1; subtype 4: 1/0.

DENV PCR - Molecular Test Result Summary			
Altona 3.0 and 1.0 Testing		**ARUP LDT**	
Number of Tests:	475	Number of Tests:	475
Number Positive:	68	Number Positive:	45
Number Negative:	407	Number Negative:	430
Number Successfully Subtyped:	47	Number Successfully Subtyped:	45
Subtype 1:	37	Subtype 1:	41
Subtype 2:	8	Subtype 2:	3
Subtype 3:	1	Subtype 3:	1
Subtype 4:	1	Subtype 4:	0





NS1 Antigen test results for 77 specimens: 36 positive/38 negative/ 3 invalid.

InBios NS1 Testing	
	7
Number of Tests:	7
	3
Number Positive:	6
	3
Number Negative:	8
Number Invalid:	3

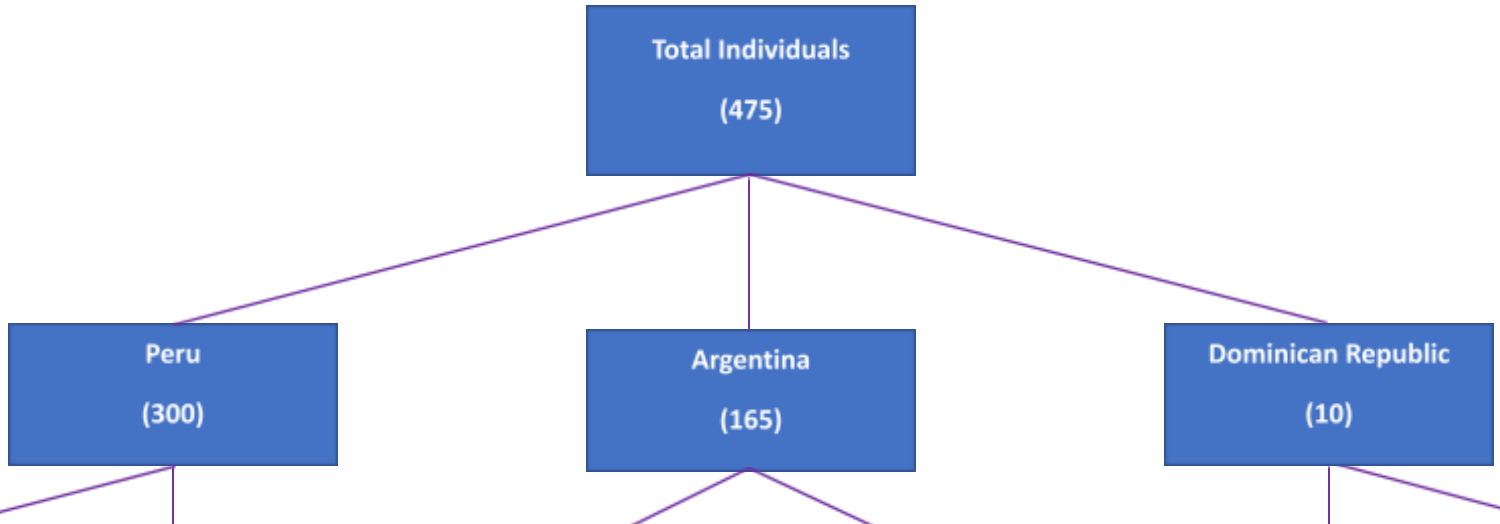
In this cohort, DENV PCR was positive for 14.3% (Altona) and 9.5% (ARUP) with predominant subtypes 1 and 2. The PCR positive cohort (74 subjects with valid NS1 results) also had 46.7% positivity for NS1 antigen. Therefore, 38 were negative for NS1 antigen.

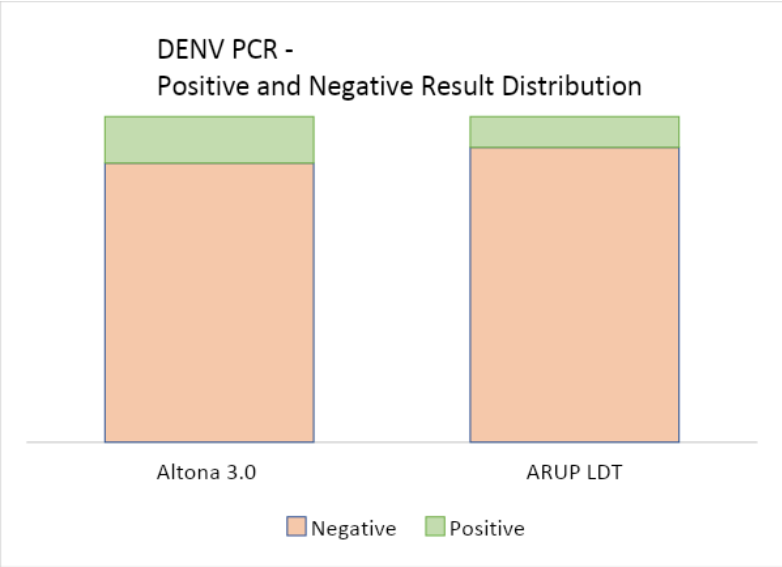
Conclusions: In conclusion, the PCR methods presented for DENV detection and subtyping may correlate well with each other. In addition, this study confirms that NS1 antigen testing may be a useful additional screening

		test for dengue fever in the first 7 days of symptom onset.

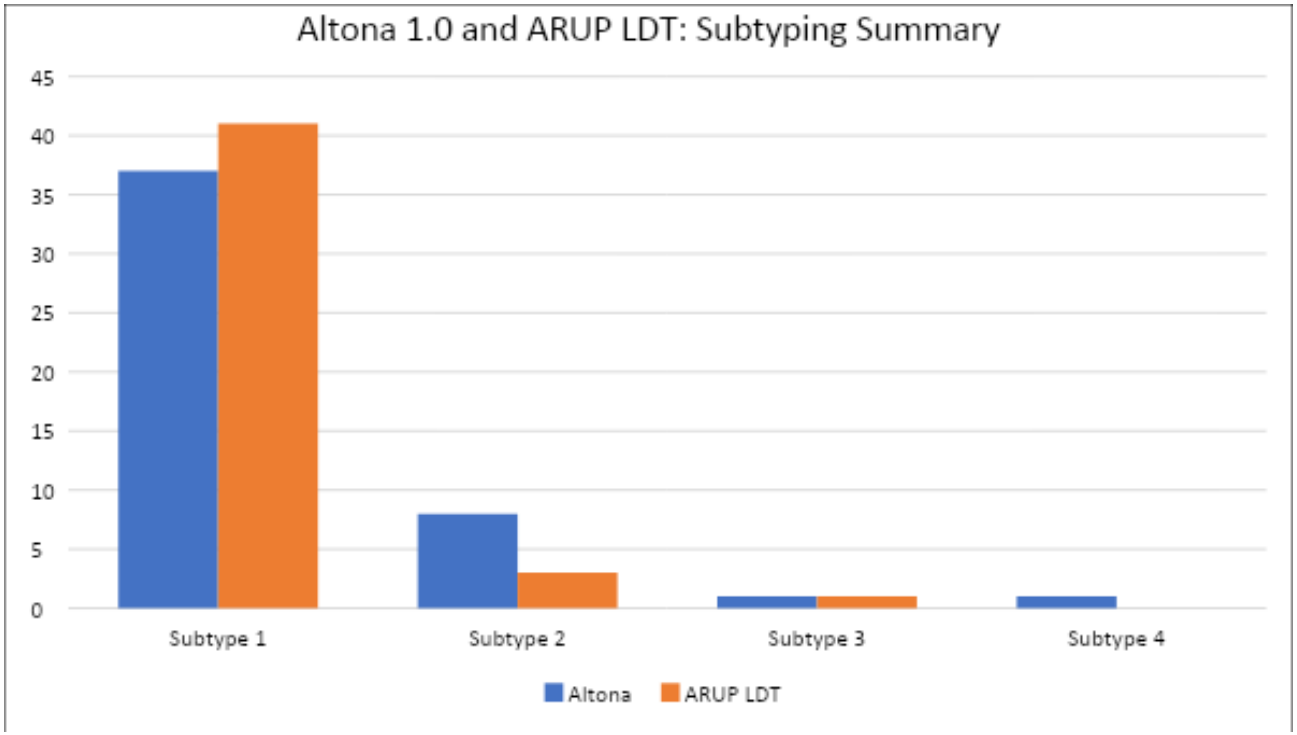
DENV PCR - Molecular Test Result Summary			
Altona 3.0 and 1.0 Testing		**ARUP LDT**	
	47		47
Number of Tests:	5	Number of Tests:	5
Number Positive:	68	Number Positive:	45
	40		43
Number Negative:	7	Number Negative:	0
Number Successfully Subtyped:	47	Number Successfully Subtyped:	45
Subtype 1:	37	Subtype 1:	41
Subtype 2:	8	Subtype 2:	3
Subtype 3:	1	Subtype 3:	1
Subtype 4:	1	Subtype 4:	0

InBios NS1 Testing	
Number of Tests:	77
Number Positive:	36
Number Negative:	38
Number Invalid:	3





InBios NS1 Testing	
Number of Tests:	77
Number Positive:	36
Number Negative:	38
Number Invalid:	3


Altona 1.0 and ARUP LDT: Subtyping Summary
45
40
35
30
25
20
15
10
5
0
Subtype 1
Subtype 2
Subtype 3
Subtype 4
Altona
ARUP LDT