FMD SITUATION IN TURKEY

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West Eurasia Roadmap FMD Control 2010-2020

OUTLOOK

- *FMD CURRENT SITUATION &INCIDENCE*
- *IDENTIFICATION FMDV SEROTYPE AND STRAINS SIRCULATED IN TURKEY*
- *GENETIC ANALYSIS*
- *CONTROL STRATEGY*

CURRENT SITUATION

- **ANATOLIA**

- **FMD is endemic in Anatolian Region of Turkey (Serotypes A , O and Asia-1).**

- **Field strains circulating in Turkey are:**
  - **A Iran 2005 (endemic in Anatolia since Nov 2005)**
    - **Sub lineage: A Iran05/AFG-07(SIS10)&USK-11**
  - **Type O Panasia II (endemic in Anatolia since Oct 2006)**
    - **Sub lineage: O Pan Asia/ANT-10**

  - **After the 9 years, new incursion was occurred due to serotype Asia-1 (first occurrance June 2011)**
    - **Sub lineage: Asia-1 Group-1 (AFG-07(?))**
- **FMD has not occurred in Thrace since 12/09/2007.**

- ***THRACE REGION IS FMD-FREE WITH VACCINATION***

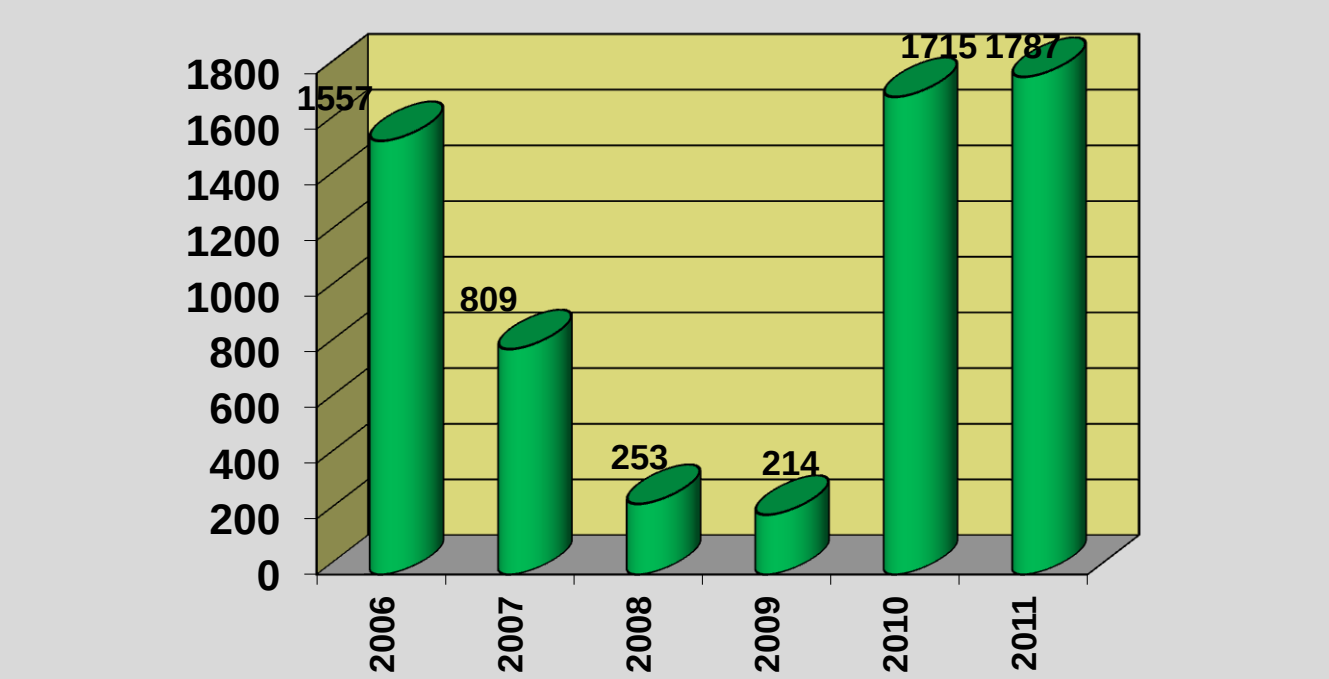
FMD INCIDENCE

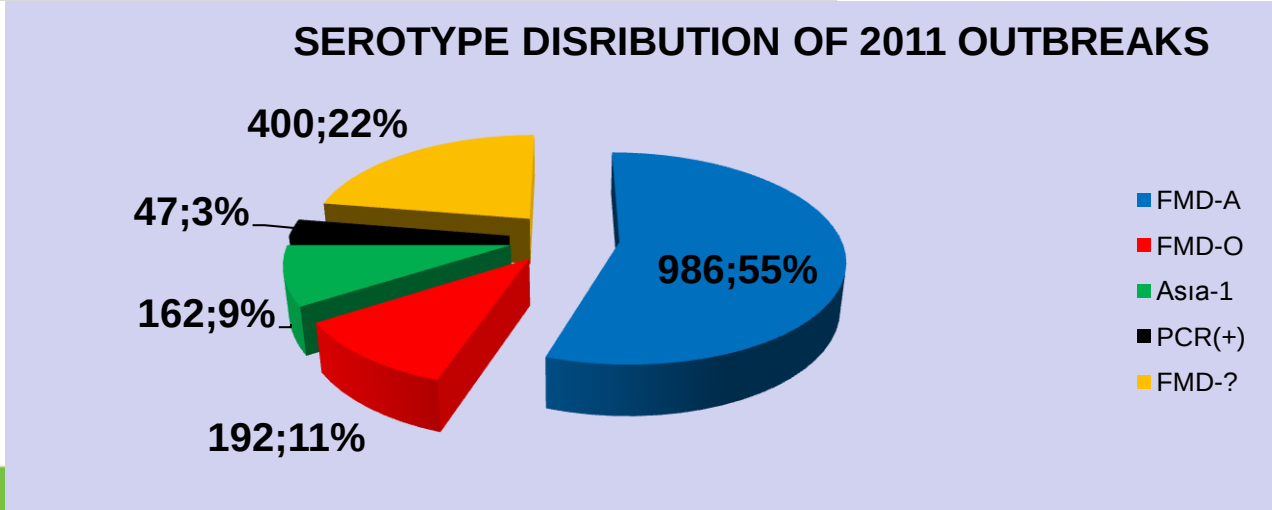
- TurkVet database and database of Şap Institute from generated epidemiology unit and serosurveillance were used for incidence
- Each notified FMD case was investigated by VS and recorded outbreak data in TurkVet system
- Two outbreak investigation reports are generated for each outbreak; initial and final investigation report for the first visit of outbreak and after the lifting the quarantine respectively
- Village is considered as epidemiological unit in Turkey. For calculation of incidence; Not only ratio of number of outbreaks to total epi unit, but also ratio of number of affected animals to pop. size are considered

FMD INCIDENCE(2)

- Incidence is 3,09 and 4,59 based on affected animals and number of outbreaks respectively (TurkVet system) ((1551 recorded outbreaks/37000 epi units); 56754 affected animals/18832894 size of pop.))
- Data for NSP ELISA serosurveillance is much more valuable for incidence rate calculation; reflects to real situation
- Regularly serosurveillance has been conducted in Anatolia last three years
- Incidence rate from latest serosurveillance was variable for each region and epi unit

FMD INCIDENCE(4)





Serotype distribution for FMD Outbreaks in Turkey in 2012 tested by ŞAP INSTITUTE

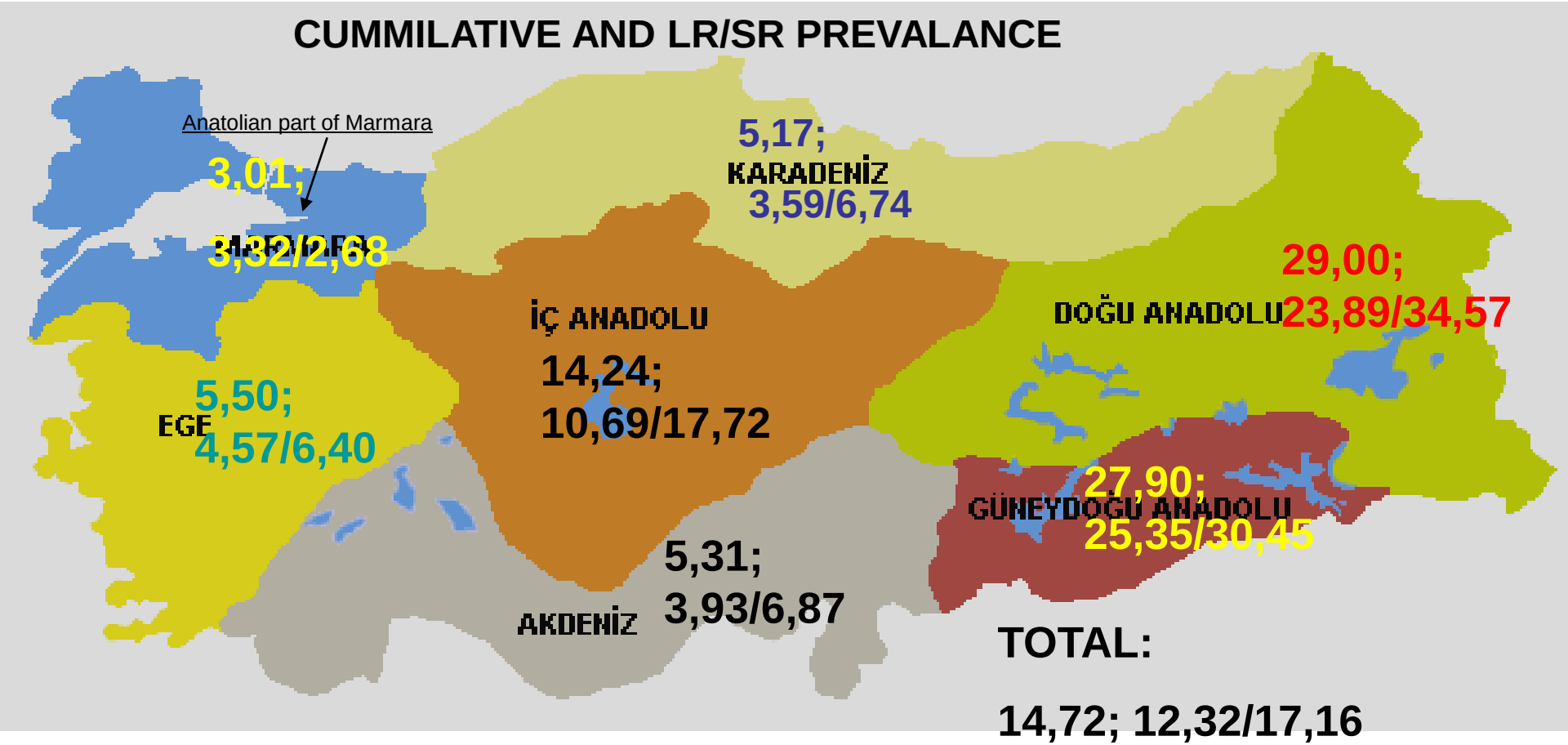
▪Type O : 3 O PanAsia-II (?)	▪Type Asia1 : 125 New Group-1
▪Type A: 35 (A Iran 05 SIS-10/USK11)	▪Unidentified (not sampled or untyped):22
IN TOTAL: 185	


Karadeniz
Avrupa Otoyolu
Marmara Denizi
Ankara
Türkiye
Kos
Lefkoşa
Kıbrıs
Lübnan
Beyrut
Map Data © 2012 AND
:Type O;
:Type A;
:Type Asia-1;
J:January
F:February

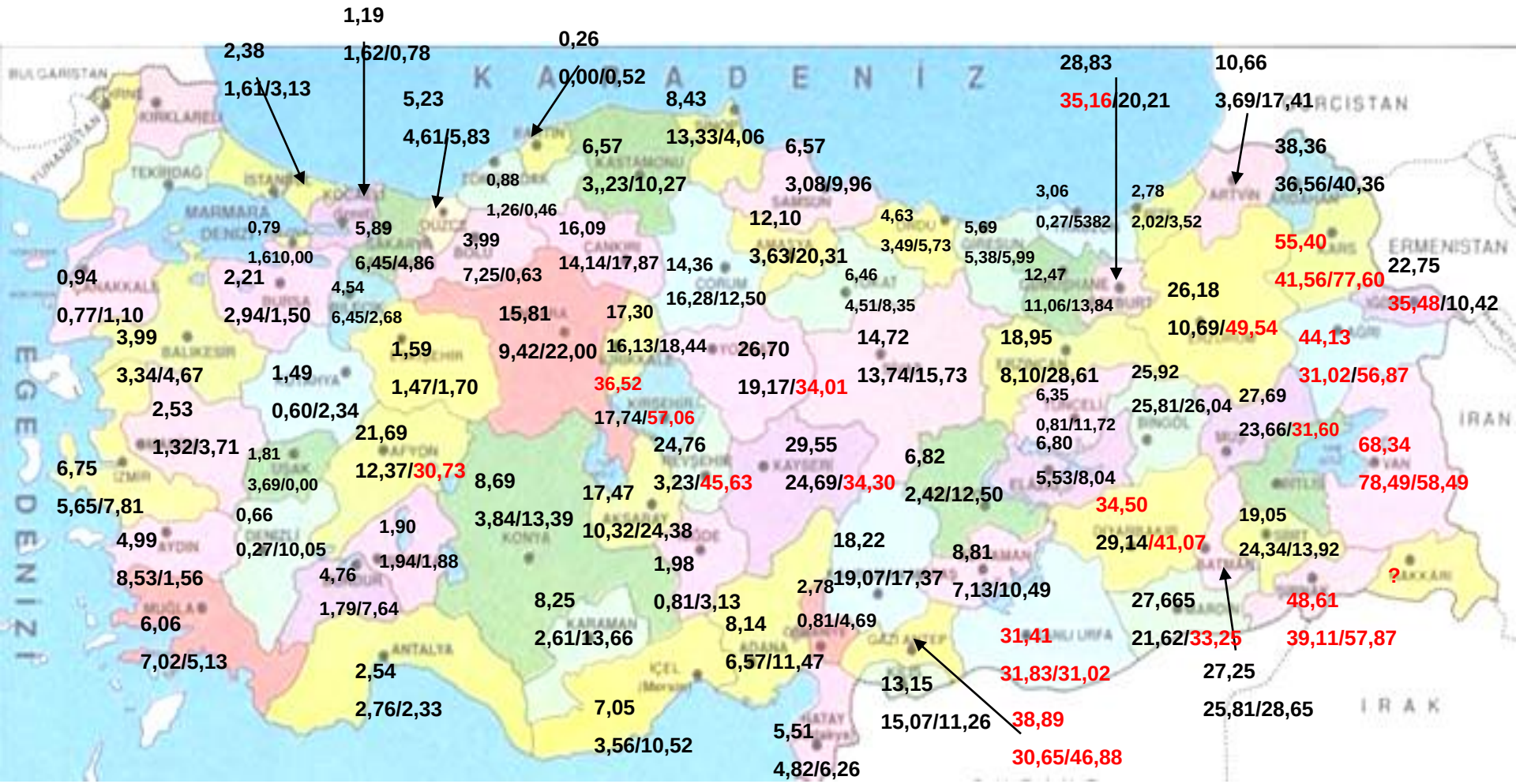
2010, SPRING ANATOLIAN SEROSURVEILLANCE

ESTIMATED PREVALANCE BY REGION

CUMMILATIVE AND LR/SR PREVALANCE



Map Distribution of Estimated Prevalance by Province



*= cumm prevalance

LR/SR

GENETIC ANALYSIS BY ŞAP INSTITUTE

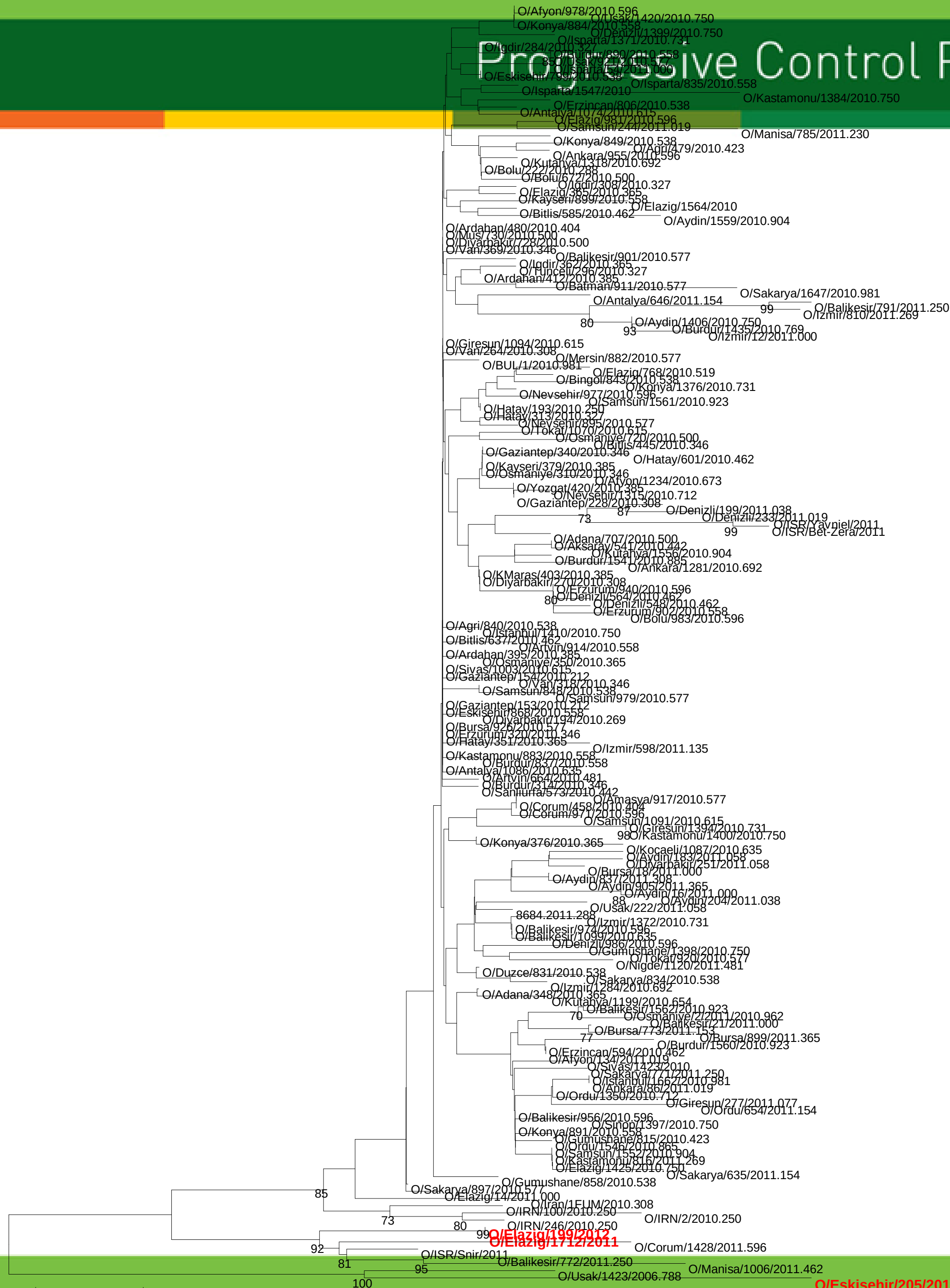
Genetic characterisation of FMD Viruses in Turkey (2010/2011/2012)

Genotypes	SEROTYPES			Total	2012
	A (IRN 05)	O (PanAsia II)	Asia 1		
AFG-07	7			7	
SIS-10	230			230	9
USK-10(*)					7
ANT-10		46		46	3(*?)
BAL-10		8		8	
New Group			36	36	6
TOTAL	**237**	**54**	**36**	**327**	**25**

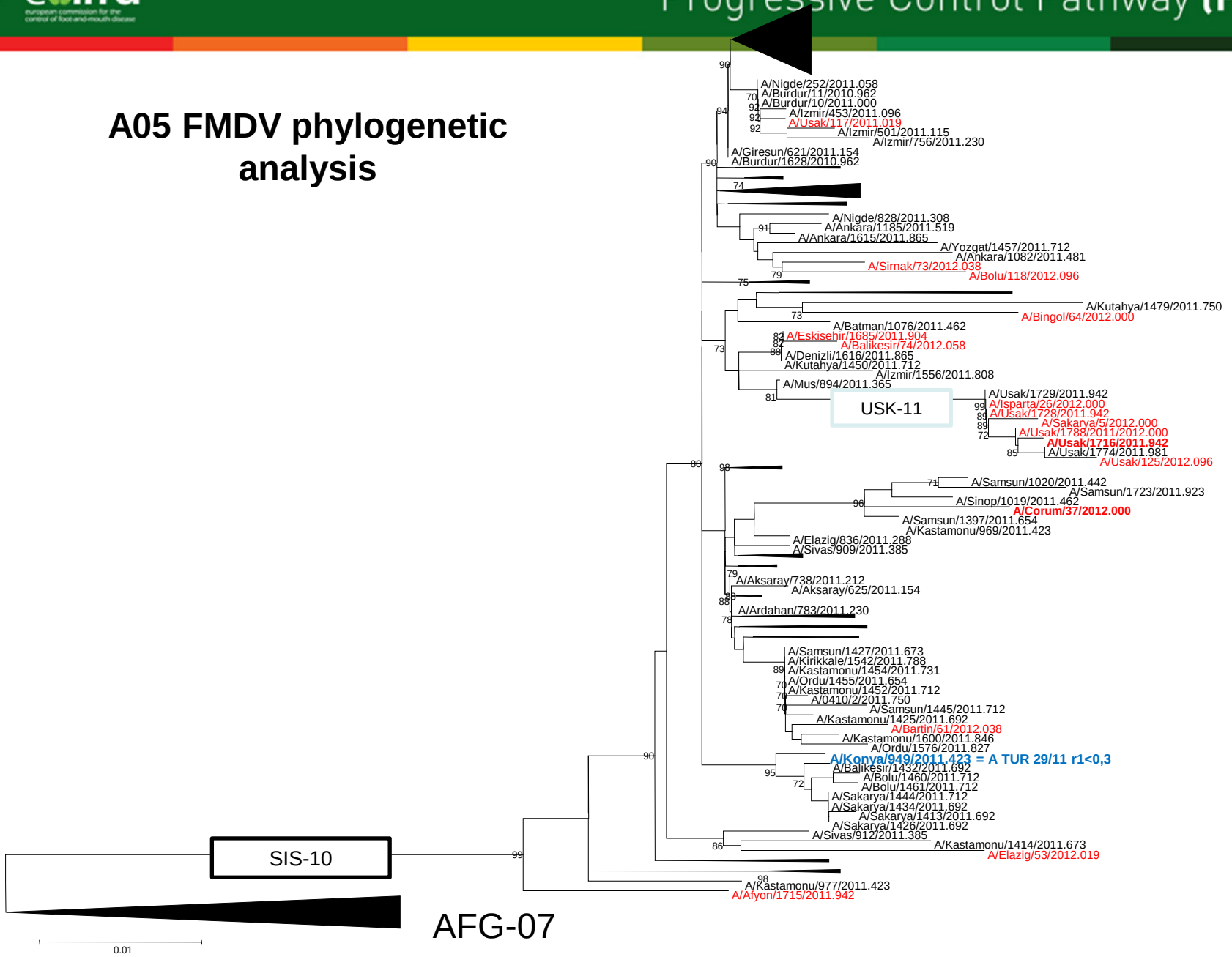
(*) New

european commission for the control of foot-and-mouth disease

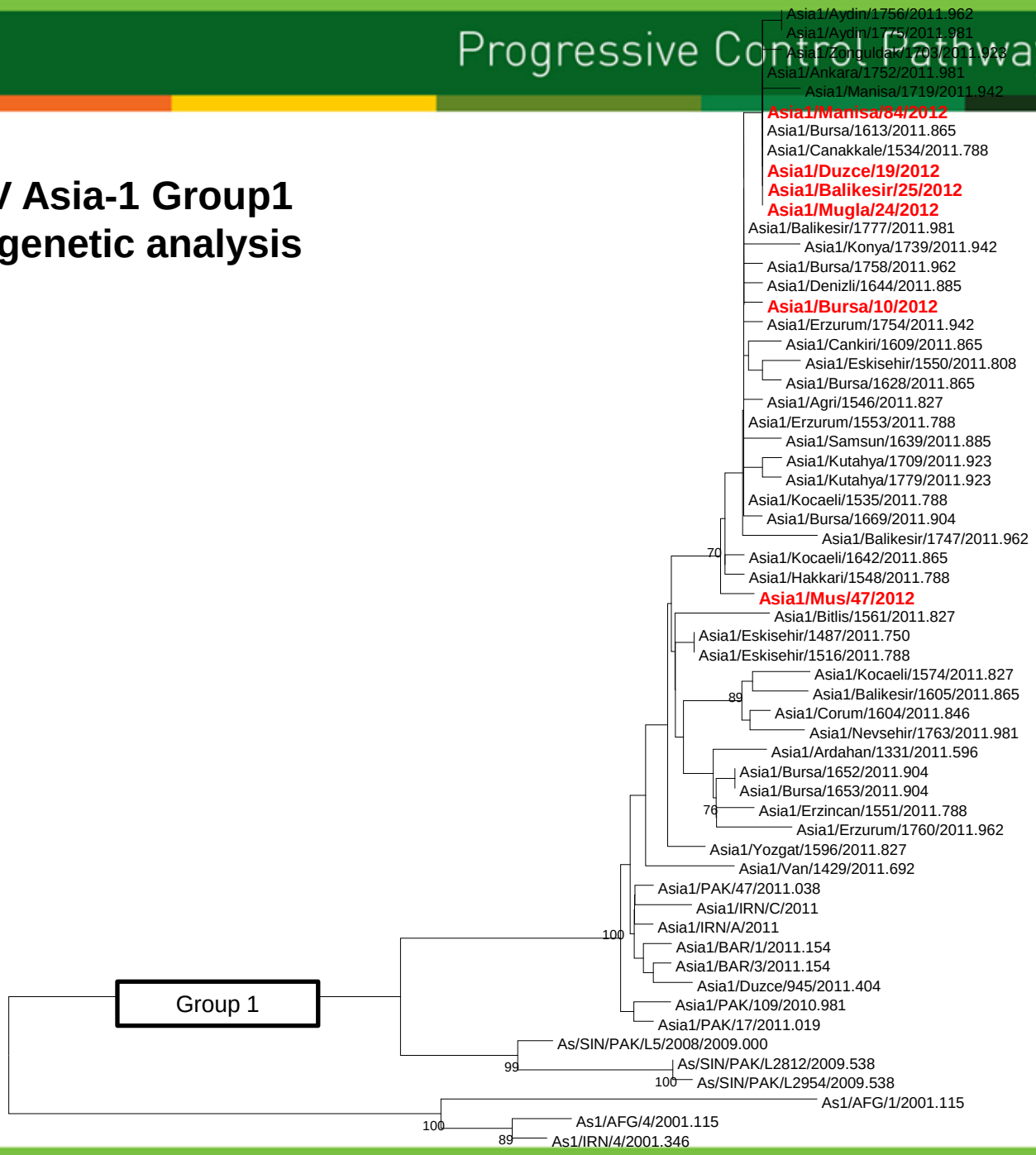
Progressive Control Pathway (PCP)



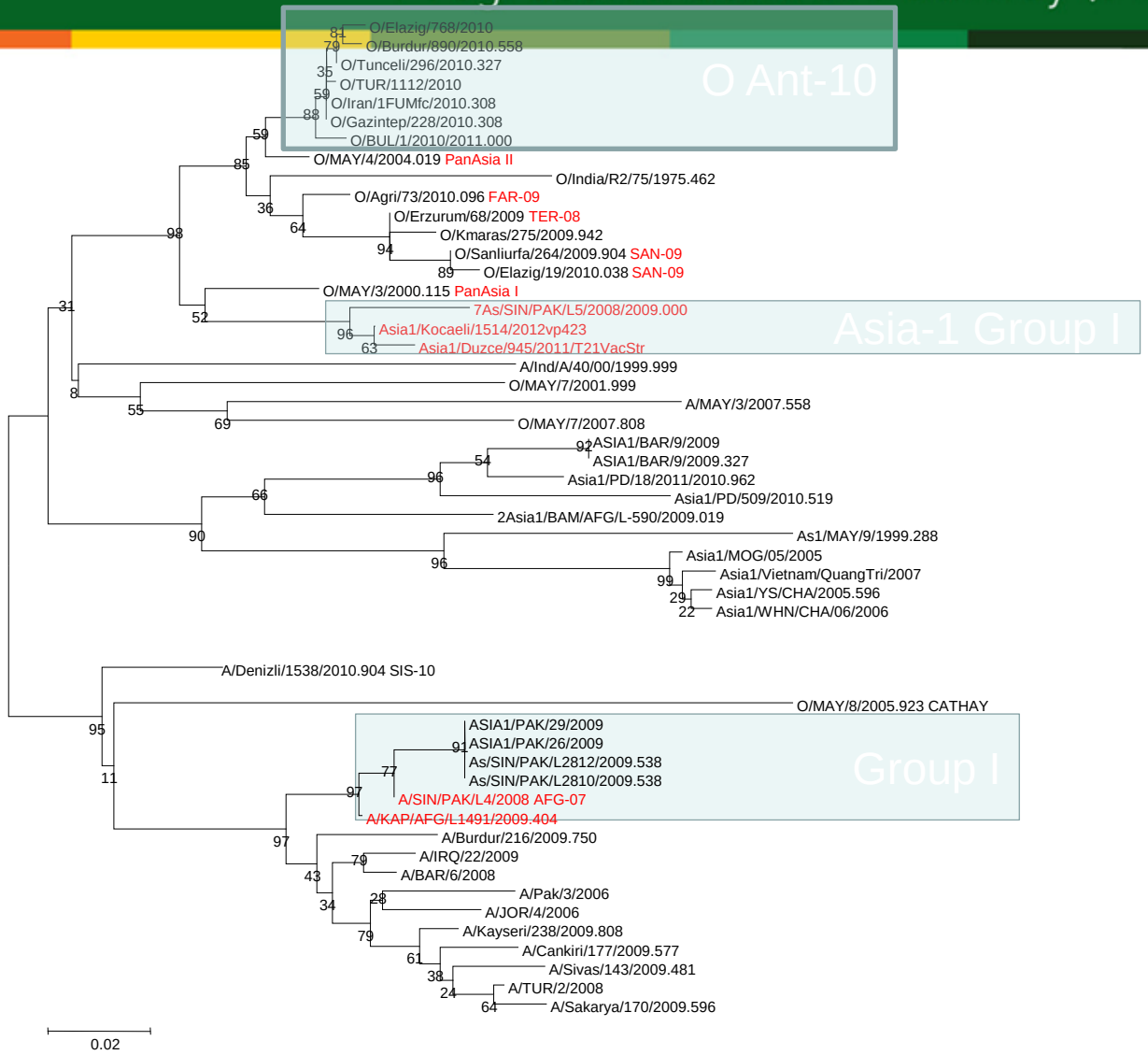
A05 FMDV phylogenetic analysis



FMDV Asia-1 Group1 phylogenetic analysis



Genetic relationship analysis of Asia1 Group 1 with the others serotypes (A-O-) based on VP4



ANTIGENIC CHARECTERIZATION BY WRL

Field İsolate	Vaccine ID								
TYPE O	O Manisa	O Ind R2/75	O BFS	O 4625	O PanAsia 2	O TNN 24/84	O CAMPOS	O Tur 5/09	O Tur 07
Tur 03/2009	>0,86	>1,0	0,25						
Tur 35/2009	0,24	0,43	0,28						
Tur 15/2009	0,19	0,50	0,20						
Tur 17/2009	0,21	0,54	0,25						
Tur 01/2010	0,26	0,72	0,49						
Tur 05/2010	0,23	0,76	0,10						
Tur 18/2010	N	M	M	M	M	M			
Tur 39/2010	M	M	M	M	M	M			
Tur 08/2011	0,46			>0,76			0,54	>0,93	
Tur 25/2011	0,30			>0,77			0,59	0,43	0,83
Tur 28/2011	0,49			>0,87			0,64	>1,0	
Tur 33/2011	0,47			>1,0			0,63	>1,0	0,82

Field İsolate	Vaccine ID				
TYPE A	A22 IRAQ	TUR 06	SAU 91	ERİ 98	IRN 2005
Tur 07/2009	0,13	0,44	0,03	0,05	
Tur 40/2009	0,06	0,79	0,01	0,10	
Tur 40/2010	M	M			M
Tur 43/2010	N	N			N
Tur 13/2010	N	M			M
Tur 02/2011	N	M			M
Tur 29/2011	0,18	0,20			0,12
Tur 64/2011	0,14	0,30			0,11

Field İsolate	Vaccine ID			
ASIA-1	ASİA-1 IND 8/79	ASİA-1 SHAMİR	ASİA-1 WBN 117/85	ASİA-1 TUR 11
Tur 07/2009	0,13	0,20	0,15	
Tur 40/2009	0,18	0,21	0,18	

CONTROL STRATEGY

- Mass vaccination
- Epidemiological investigation
    - Active and passive surveillance
    - Outbreak investigation and case study
    - Follow-up
- Routine control measures in case of outbreak
    - restriction and ban of animal movement
    - quarantine (3km/10km), disinfection
    - ring vaccination,
    - sampling, diagnosis
- Control of animal movements; registration/monitoring movement by Turvet system,
- Training and awareness activities

PHASE II EURAID PROJECT

- **Objective**

  The control of foot and mouth disease by means of an efficient vaccination policy.

  Achievement the zonal freedom with vaccination; Anatolian part of Marmara and Egean Regions

- **Total Budget**

  38.000.000 € (15% contribution by national budget)

- **Duration**

  3.5 Years; starting second half of 2011/end 2014

ACTIVITIES

- **Vaccination**
- **Sero-survey**
- **Cleaning and Disinfection**

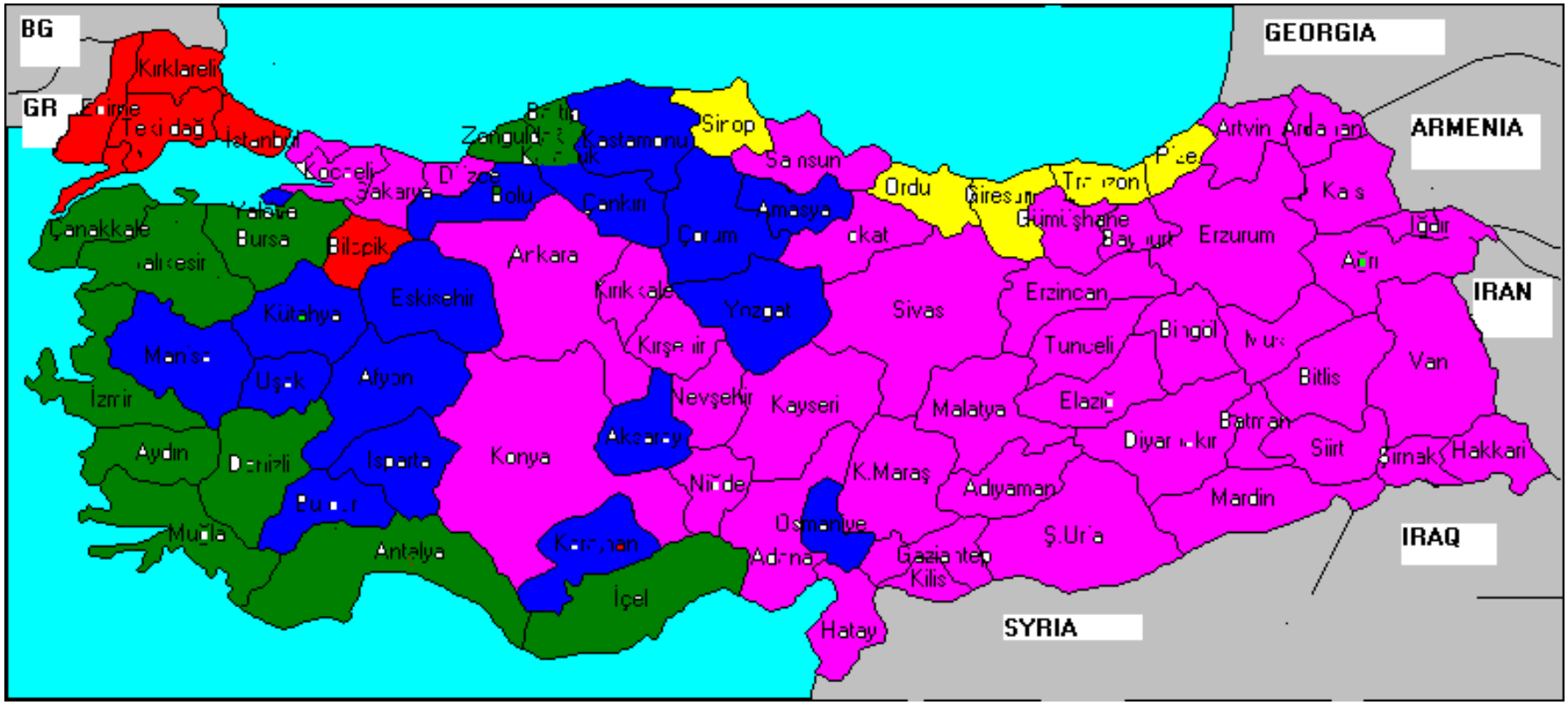
VACCINATION STRATEGY

- All large ruminants population is targeted for vaccination;
  - twice a year: Spring and Autumn
- Small ruminants in Marmara and Aegean region
  - once a year
- When outbreak occurrence:
  - Ring vaccination for all population under the risk

Vaccine strains used in Turkey

Vaccine Strain	Genotype	Started to be used	End of use
O Manisa	?		07/2011
O TUR 07	O PanAsia II	01/2011	Current
A 22 Mahmatli	?		1998
A Aydin 98	A Iran 96	1998	02/2006
A Nevsehir	A Iran 05	02/2006	03/2007
A 22 Iraq 24/64	?	03/2007	11/2008
A TUR 06	A Iran 05	11/2008	Current
Asia 1 Shamir	?	2008	08/2011
Asia 1 TUR 11	Not Named	08/2011	Current

Map distribution for vaccine delivering Autumn Vaccination campaign in 2011



Purple: Şap Enstitüsü Trivalent

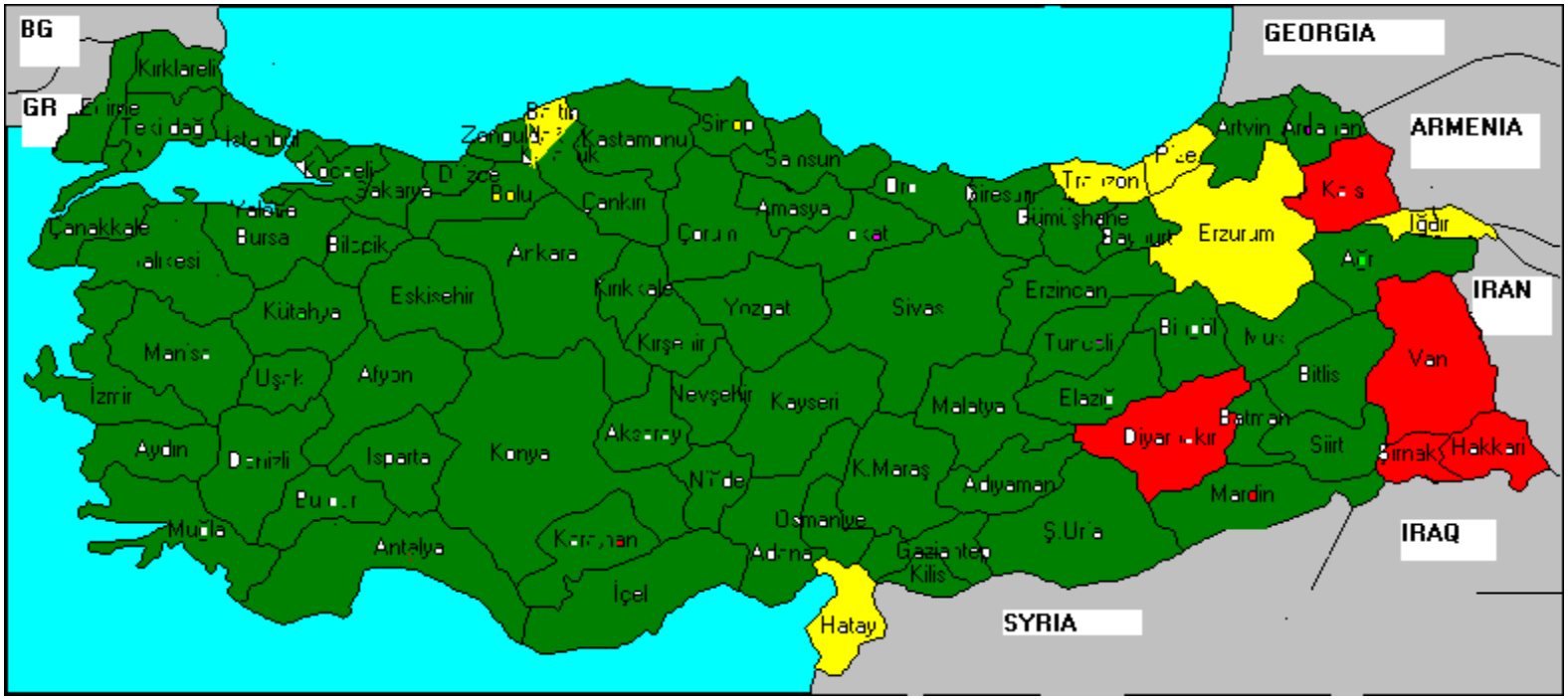
Blue: Şap / İntervet Trivalent

Red: İntervet Trivalent

Green: Intervet Bivalent

Yellow: Intervet Bivalent / Şap Trivalent

Vaccine coverage for 2011 Autumn Vaccination campaign in Turkey



%85-100

%60-84

%0-59

Vaccine Effectiveness Studies conducted in Turkey for Asia 1 TUR 2011/Shamir and A Tur06

Beyond the routine outbreak investigation by VS, two investigation were conducted to asses vaccine effectiveness:

-Ardahan; evaluation Asia-1 Shamir/A Tur06

-Afyon; evaluation mainly Asia-1 new Tur vacc.

Afyon:

- Unadjusted vaccine effectiveness of the new Asia-1 vaccine was estimated to be 73% [95%CI=54%-84%]

- 44 % vaccination coverage
- Animals were vaccinated only once or none
- Outbreak two months pv

RISK ASSESSMENT

- **The new virus incursion/vaccine failure case in some country in the West Eurasia region**
  - Beyond the current circulated serotypes, A and Asia-1; there has been high risk regarding to new O incursion
  - Has question on the current Type A Tur 06 vaccine strain for matching with field isolates
  - Frequently genetic variation and antigenic diversity resulted the problem on the vaccine availability
- **Illegal animal movements at the eastern and south-eastern borders**
- **High meat price existed in Turkey which provacates the illegal animal movement from the neighboring countries**
- **Lack of public awareness particularly in East Anatolia**
- **Current socioeconomic structure and animal husbandry system in East Anatolia**
- **Inefficiency on the booster vaccination policy**

CONTROL STRATEGY AND PREVENTIVE MEASURES IN THRACE 2011

CONTROL STRATEGY CONDUCTED IN THRACE REGION

Risk based control measures are implemented to substantiate free status

- All livestock were **vaccinated**;
  - LR twice a year/SR once a year
- **Animal movements**
  - from Anatolia were controlled; execute OIE TAHC
- **Check points**
  - were established on bridges and harbours for animal movements
- **Passive and active surveillance**
  - was implemented regularly

CONTROL STRATEGY CONDUCTED IN THRACE REGION

Additional Measures for Kurban Festival

- **Animals imported** from FMD-free countries for Thrace region;
- Animals from Anatolia not accepted for Thrace region, applied TCAH of OIE
- All livestock checked systematically by **clinical surveillance before and after the festival in Thrace region**
- **Temporary animal markets** designated for the festival are tightly checked
- Unsold animals slaughtered in place

Additional measures implemented in Thrace in response to the outbreak in Bulgaria

Measures put in place

- All livestock markets were closed during the active disease period,
- Animal movements were stopped,
- Livestock were to be kept confined in the areas defined as risk areas.
- In the areas defined as risk areas, including the villages close to the Bulgarian border, **supplementary vaccination** has been implemented for all susceptible animals

SURVEILLANCE ACTIVITIES IN THRACE 2011

Serosurveillances in Thrace were conducted in 5 categories and different time duration.

Short descriptions are as follows;

1. 2011 spring serosurveillance (forests) was design to target wild and domestic animals in forestry areas of TT where possible contacts might happen between them and activate virus circulation as a part of the Bulgarian outbreak
2. 2011 summer serosurveillance (borderline) was design to target SR and LR in locations close to high risk area in Bulgaria
3. 2011 summer serosurveillance was a regular serosurveillance and carried out in whole TT
4. 2011 summer water buffalo serosurveillance was species targeted and sampling locations
5. 2011 autumn serosurveillance (sub-zonal TT) excluded borderline districts and villages in Kırklareli province confined by red line and Bulgarian border

		1-2010 autumn (whole TT)		2-2011 spring (forests)[d]		3-2011 summer (borderline)[f]		4-2011 summer (Whole TT)		5-2011 summer (Water buffalo)		6-2011 autumn (sub-zonal TT)[g]	
		Mass Serosurveill.	Follow up step	Mass Serosurveill.	Follow up	Mass Serosurveill.	Follow up	Mass Serosurveill.	Follow up	Mass Serosurveill.	Follow up	Mass Serosurveill.	Follow up
Actual sampling profile[a]	LR	3534/64/57/NA	2408/NA/40/23	10932/80/147/NA[c]	2622/NA/29/24	1102/50-60/19/NA	1178/all LR&SR/3/NA	8832/64/138/NA	1321/NA/17/15	1249/60-70/22/NA	240/All LR&SR/2/2	8960/64/140/NA	611/100-150/6/5
	SR	8694/66/138/NA				1197/60-70/19/NA		9108/66/138/NA				9188/66/140/NA	
Age targeting (months)	LR/SR	4-18	All ages	4-24	All ages	All ages	All ages	4-18	All ages	All ages (only water buffalo)	All ages (all LR and SR)	4-24	All ages
CI% (primary/secondary)	LR/SR	95/95	95	97.5/97.5	NA/95	NA/95	NA/95	95/95	NA/95	NA/95	NA/NA	95/95	NA/95
Minimum expected prevalence % (primary/secondary)	LR	5/5	NA/2	2/10	NA/2	NA/5	NA/2	2/5	NA/2	NA/5	NA/NA	2/5	NA/2
	SR	2/5						2/5				2/5	
Mass screening results (positive %)	LR	0.49 (18 w+ve)	0.91 (9LR and 13 SR)[b]	0.26 (8LR and 21SR, 28w+ve, 1s+ve)	0.34 (1LR, 8SR)[b]	0.18 (2 w+ve)	0.16 (2 animals)[b]	0.18 (11 w+ve)	0.98 (8LR, 5SR)	0.16 (2w+ve)	All -ve	0.044 (4 w+ve)	0.37 (2+ve)
	SR	0.32 (27 w+ve, 3s+ve)				0.08 (1 w+ve)		0.06 (6 w+ve)				0.021 (2 w+ve)	
Retesting (positive %)	LR	0.02 (1 w+ve)	NA	% 0.045 (5w+ve)	NA	0.18 (2 w+ve)	NA	0.035 (w+ve)	NA	0.00	NA	0.00	NA
	SR	0.04 (3w+ve, 1+ve)	NA		NA	0.00	NA	0.00	NA			0.00	NA
LPB-ELISA (Confirmatory for +ves)	LR	w+ve	s+ve[b]	s+ve[e]	s+ve[b,e]	s+ve[e]	NA	1 w+ve	s+ve[e]	2 s+ve[e]	NA	3w+ve, 1 -ve	2s+ve[b,e]
	SR	w+ve	s+ve[b]					6 w+ve				1 w+ve, 1 -ve	
Western blotting (Confirmatory for +ves)	LR	-ve	-ve	-ve	-ve	NA	NA	-ve	NA	NA	NA	NA	NA
	SR	-ve	-ve	-ve	-ve	NA		-ve				NA	NA
Probang (virological)	LR	NA	-ve	NA	-ve	NA	NA	NA	-ve	NA	-ve	NA	-ve
	SR	NA	-ve	NA	-ve	NA	NA	NA	-ve	-ve		NA	-ve
Clustering of positive animals	LR	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve
	SR	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve
Conclusion (virus circulation)	LR	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve
	SR	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve