Supplementary information

Supplementary Table 1 Studies investigating animal norovirus in animals and the detection methods that were applied. Included are studies that analyzed faecal samples by RT-PCR, real-time RT-PCR or EM and serological studies. Frequently used primers sets are p289/p290 and p290/p110 (universal calicivirus primers, RdRp), JV12/JV13 (norovirus specific), PNV7/PNV8 (porcine norovirus specific, RdRp), G2SKF/G2SKR (GII, capsid), MON432/MON477 (norovirus), FNoV-F9 and FNoVR15 (GIV specific), JV102/JV103 (canine norovirus specific), CBeCu-F/R (bovine norovirus specific). Unless otherwise stated sample were collected at one time point. a=longitudinal study, b=case control, c=outbreak. A=adult (in pigs >6month), J=juvenile

Location	Host	Investigated genogroup, genotye	Animal norovirus virus detected	Prevalence (%)	Detection method	Primers, probes and antigens used	Sample collection		Age Clinical status Adult (A) Juvenile (J) Symptomatic (+) Asymptomatic (-)	Ref
							Sample type Faeces (F) Pooled Faeces (PF) Sera (S) Intestinal content (IC)	Location (n)		
The Americas										
USA	Pigs	GII.11/18/19	GII.11/18/19	64/621 (10)[1]	RT-PCR, microwell hybridization	PNV7/PNV8, Hybridization probes specific for GII.11/18/19	F[a]	Farms #7 Abattoirs #1	J/A-	[191]
	Pigs	GII.11	GII.11	78/110 (71)	ELISA	VLPs of GII.11 (SW918)	S	Farms Abattoirs #1	NA	[46]
		calicivirus	none	0/104 (0)	RT-PCR	p289H,I-p290H,I,J,K	F/IC	Farms #1 Abattoirs #2	J-	
	Pigs	GII.11/18/19	GII.11/18	78/413 (19)	RT-PCR, microwell hybridization	PNV7/PNV8, G2SKF/G2SKR. Hybridization probes specific for GII.11/GII.18/GII.19	PF	Farms #9	A-	[28]
	Pigs	calicivirus	GII.11/18/19	6/275 (2)	RT-PCR	p290/p110	F	Farms #6 Abattoirs #1	A-	[25]
	Pigs	calicivirus	none	0/139 (0)	RT-PCR	p290/p110, G2SKFM-Po/G2SKRM-Po, JV12Y/JV13I	F	Farms #3	J	[48]

	Cattle	GIII.2	GIII.2	231/231 (100)	ELISA	VLPs of GIII.2 (AF542084)	S[a]	Feedlots #3	J	[49]*
	Cattle	calicivirus	GIII.1/2	54/75 (72)	RT-PCR	NV35/36, p290/p289 JV12/13 J11 U/L, J21 U/L, BEC-POL5/3, NBU-F/R, CBECU-F/R,	RS[a,b]	Farms #2	J	[52]*
	Cattle	GIII	GIII	128/444 (29)	real-time RT-PCR	BNoV-fwd/rev (1014)	F[b]	Farms #140	J+/-	[50]
	Cattle	norovirus	GIII.1/2	52/74 (70)	RT-PCR	MON432/MON477, CDC primer set	F	Farms #22	J+	[51]
	cats	calicivirus	GIV.2	6/24 (43)	RT-PCR	p289/p290, FNoV-F9/FNoVR15	F[c]	Clinic #1 Shelter #1	J/A+/-	[53]
	cats	all	GIV	1/6 (17)	RT-PCR	metagenomics, random primers	PF	Shelter #1	NA	[54]
	Sea lion	all	GII/GIV	4/47 (9)	RT-PCR	metagenomics, random primers	F	Marine mammal centre #1	J/A	[55]
Canada	Pigs	norovirus	GII.11/18	26/120 (22)	RT-PCR	Region B and A primer MON431-MON434 (GI, GII), G1/G2 (SRSV)	PF[a]	Farms #10	NA	[30]
	Cattle	norovirus	GIII.2	2/179 (1)			PF	Farms #45	J/A	
	Pigs	calicivirus	GII.11/18	17/20 (85) [2]	RT-PCR	p289/p290, p289N/p290N	PF/F	Farms #20	J/A	[31]
	Pigs			12/66 (18)			IC[3]	Abbattoirs #2	A-	
	Pigs	calicivirus	porcine NoV	4/200 (2)	real-time RT-PCR, RT-PCR	p289/p290, qRT-PCR COG2F/COG2R (GII), probe RING2	F	Farms, Abattoirs	N	[32]
Venezuela	Pigs	calicivirus	none	0/137 (0)	RT-PCR	p289/p290, GLPSG1/YGDDI, GLPSG2/YGDD1	F	Farms #7	J +/-	[39]
	Cattle	GIII	GIII	1/129 (1)	RT-PCR	NA	F	NA	NA	[56][12]
Argentina	Cattle	GIII	GIII.1, GIII.2, Not typed	3/90 (3)	RT-PCR	CBECu-F/CBECu-R	F	Farms	J+	[57]
Brazil	Pigs	GII.11/18/19	GII.11	58/112 (52)	RT-PCR	SwNV1/SwNV2	F	Farms	A-	[44]
	Pigs	calicivirus	GII.18	1/96 (1)	RT-PCR	p289/p289HI, p290/290HIJK, Mon431/432, 433/434	RS	Farms #5	J/A +/-	[58]
	Pigs	calicivirus	GII.11/18/19	20/261 (7)	RT-PCR	p289/p289HI, p290/p290HIJK, Cap C/D3/D1	F/IC	Farms #6, Abattoirs #1	J/A +/-	[59]

	Pigs	calicivirus	none	0/169 (0)	RT-PCR	p289/p290	RS	Farms #5#	J+/-	[60]
	Pigs	calicivirus	GII.11	2/30 (7)	RT-PCR	p289/p290, SwNV1/SwNV2	RS[c]	Farms #4#	J+	[61]
	Cats	calicivirus	GIV.2	1/29 (3)	RT-PCR, Real-time RT-PCR	p289H/p290H, FNoV-09/FNoV-R15, Mon4FR, Probe Ring4	F[c]	Shelters #4	J+	[62]
Europe										
Italy	Pigs	GII.11/18/19	none	0/242 (0)	RT-PCR	PNV7/PNV8	F	Farms #8	J/A +/-	[76]
	Pigs	calicivirus	GII.11	1/201 (0,5)	RT-PCR	p290/p289/p110, PNV7/PNV8	F	Farms #15	J/A -	[77]
			none	0/89 (0)			F	Farms #2	J+	
	Cattle	GIII	GIII.1/2	11/104 (11)	RT-PCR	CBECU-F/R		Farms #16	J-	[78]
	Cattle	GIII	GIII.1/2	21/101 (21)	RT-PCR	JV12/13 J11 U/L, J21 U/L, BEC-POL NBU-F/R, CBECU-F/R, J11U/CBECU-R	F	Farms	J-	[79]
	Dogs	GIV.2, GVI.2	total	66/516 (5)	ELISA	VLPS of GIV.2 (EF450827), GVI.2 (JF930689)	S	Households	J/A	[80]
			GIV.2	20/516 (4)						
			GVI.2	46/516 (9)						
	Dogs	calicivirus	GIV.2	4/183 (2)	RT-PCR	p289/p290, JV12Y/JV13I		NA	J+	[82]
	Dogs	GIV.2	GIV.2	5/103 (5)	ELISA	VLP of GIV.2 (EF450827)	S	NA	A	[81]
	Dogs	GVI.2	GVI.2	6/10 (60)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
	Dogs	calicivirus	GVI.2	11/239 (5)	RT-PCR	p298/p290, JV12Y/JV13I	F	Households	J+/-	[83]
	Dogs	calicivirus	GIV.2	1/1 (100)	RT-PCR	p289/p290	F	NA	J+	[192]
	Lion	calicivirus	GIV.2	1/1 (100)	real-time RT-PCR, RT-PCR	p290/p289, JV12Y/JV13I	F	Zoo #1	J+	[84]
	Cats	calicivirus	GIV.2	3/105 (3)	RT-PCR	p289/p290, JV12Y/JV13I	F	Shelters #3	J+/-	[85]
	Cats	GIV.2	GIV.2	34/211 (16)	ELISA	VLP of GIV.2 (EF450827)	F	Clinics, Shelter, outdoors	A	[81]
Spain	Pigs	calicivirus	NA	27/221 (12)	real-time RT-PCR, RT-PCR	p289/p290, JV12/JV13. qRT PCR: probes for GI and GII	F	Farms #14, Abattoirs #1	J/A+/-	[86]
	Dogs	calicivirus	GIV.2	2/26 (8)	RT-PCR	p298/p290, JV12Y/JV13I	F	Households	J+/-	[83]
	Dogs	Canine	GIV.2	7/7 (100)	RT-PCR	JV102/JV103	F[c]	Kennel #1	J+	[88]

		Norovirus								
Portugal	Dogs	calicivirus	GVI.2	29/105 (28)	RT-PCR	p289/p290, JV12Y/13I JV102/JV103	F	Shelters, shops, clinics	+/-	[89]
	Dogs	Canine norovirus	GIV.2	60/256 (23)	RT-PCR	JV102/JV103	F	shelter, shops clinic	+/-	[87]
	Dogs	GVI.2	GVI.2	64/100 (64)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
Greece	Dogs	calicivirus	GIV.2	6/72 (8)	RT-PCR	p289/p290, JV12Y/JV13I	F[c]	Kennels, pet shop, clinic	J+	[90]
UK	Cattle	GIII	GIII.1,	77/100 (77)	ELISA	VLPs of GIII.1 (AJ011099), GIII.2 (AF320625)	S	Farms #5	A	[93]
			GIII.2	87/100 (87)						
	Cattle		GIII.1	98/100 (98)			S	Farms #7	J	
			GIII.2	66/100 (66)						
	Cattle	NA	GIII	44/398 (11)	Meta analysis	NA	F	Diagnostic	NA	[104]
	Dogs	calicivirus	none	0/227 (0)	Real-time RT-PCR	Primers and probes based on GIV.2, GVI.1, GVI.2	F[b]	Clinics #4, Kennels	J/A+/-	[105]
		GIV.2, GVI.1/2	total	189/396 (48)	ELISA	VLPs of GIV.2 (EU224456), GVI.2 (GQ443611), GVI.1 (FJ692501)	S[b]	Kennel #1 Research Institut #1	NA	
			GIV.2	47/396 (12)						
			GVI.1	78/396 (20)						
			GVI.2	8/396 (2)						
	Dogs	canine norovirus	none	0/248 (0)	Real-time RT-PCR	Canine specific primers and probes	F[b]	Clinics #6, Shelter #1	J/A+/-	[106]
		GIV.2, GVI.1, GVI.2	GIV.2, GVI.1, GVI.2	147/325 (45)	ELISA	VLPs of GIV.2 (EU224456), GVI.2 (GQ443611), GVI.1 (FJ692501)	S[b]	Kennel #1 veterinary college #1	NA	
	Dogs	GVI.2	GVI.2	23/50 (46)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
	Mice[4]	norovirus	GV	57/192 (67)	RT-PCR	GV specific, degenerate primers	F/RS[6]	Indoors	NA	[107]
	Mice[5]			11/51 (22)			F[6]	Outdoors	NA	
Ireland	Pigs	calicivirus	none	0/292 (0)	RT-PCR	p289/p290	F	Farms #4	J-	[40]
	Dogs	GVI.2	none	0/10 (0)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
Nether-lands	Pigs	norovirus	GII.11	2/100 (2)	RT-PCR, Southern blot	JV12/JV13	PF	Farms #100	A	[9]
	Cattle		none	0/43 (0)			PF	Farms #75	J	
	Cattle		GIII.2	25/75 (44)			PF	Farms #43	A	

	Chicken		none	0/48 (0)			PF	Broilers #48	J	
	Cattle	norovirus	GIII.2	77/243 (32)	RT-PCR, EM, Southern blot,	JV12/JV13	PF	Farms	J	[97]
	Cattle	norovirus	GIII.2	13/312 (4)			F[a]	Farms #1	J+/-	
	Dogs	GVI.2	GVI.2	17/50 (34)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
	Porpoise	HPNV	NA	5/49 (10)	Real-time RT-PCR	HPNV primers, GI probe	IC[7]	NA	NA	[98]
				8/34 (24)	ELISA	VLPs of KP987888	S			
Belgium	Pigs	calicivirus	GII.19	2/43 (5)	RT-PCR	JV12/JV13, p289/p290, swNo F/R	F	Diagnostic #1	J/A+/-	[99]
	Cattle	calicivirus	GIII.2	10/133 (8)	RT-PCR	p298/p290, CBECu , BEC, JV12/JV13	F[a]	Diagnostic #1	J+	[100]
		GIII.2	GIII.2	409/439 (93)	ELISA	VLPs of GIII.2 (EU794907)	S[b]		J/A	
	Cattle	norovirus	GIII.2	15/317 (5)	RT-PCR	JV12/JV13 (all NV), CCV3/CCV4, CBECU-F/CBECU-R	F	Farms	NA	[193]
	Cattle	GIII	GIII.1, GIII.2	28/300 (9)	RT-PCR	CBeCu-F/R (bovine NoV), AMG1-F/R (based on GIII.1) sequence	F	Diagnostic #1	J+	[102]
	Cattle	GIII	GIII.2	NA	RT-PCR	CBeCu-F/R	F	Diagnostic	J	[101]
Hungary	Pigs	calicivirus	GII.11	1/17 (6)	RT-PCR	p290/p289	F	Farms #2	J/A+/-	[112]
	Dogs	calicivirus	GVI	2/63 (3)	RT-PCR	p290/p289	F	Shelter	NA	[113]
	Dogs	GIV.2	none	0/10 (0)	ELISA	VLPs of GIV.2 (GQ443611)	S	Clinics	J/A	[47]
	Lab mice	calicivirus	GV	10/41 (24)	RT-PCR	p289/p290, MNV specific primer set	PF	Outdoors	NA	[114]
	Mice[8]		GV	2/3 (67)						
	Mice[9]		none	0/7 (0)						
	Bank vole		none	0/3 (0)						
Slovenia	Pigs	calicivirus	GII.11/18	5/406 (1)	RT-PCR	p290/NVp110, JV12Y/JV13I, JV12Y/NVp110 G1SKF/R, G2SKF/R	F	Farms #8	J/A-	[42]
	Cattle		GIII.2	2/108 (2)			F	Farms #4	J/A-	
Poland	Dogs	GVI.2	GVI.2	16/50 (32)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]

Finland	Dogs	GI, GII, GIV	none	0/92 (0)	real-time RT-PCR	COG2R/QNIF2 QNIFS for GII, in house primers and QNIF4/QNIF3 for GI, Mon4F/Mon4R and Ring4 for GIV	F	Household	J/A+/-	[110]
	Dogs	GVI.2	GVI.2	7/10 (70)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
Norway	Cattle	GIII	GIII.1, GIII.2	208/419 (50)	sybr green RT-PCR	BoNoV72F/BoNoV72R2 CBECU-F/BoNoV72R2	F	Farms #190	J+/-	[109]
	Dogs	GVI.2	GVI.2	16/50 (32)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
Sweden	Dogs	GVI.2	GVI.2	4/10 (40)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
Denmark	Rat[10]	calicivirus	none	0/11 (0)	RT-PCR	p289CVa/p289CVb, p289CVc/p289CVd	IC	Sewer system #5	NA	[108]
	Dogs	GVI.2	GVI.2	10/50 (20)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
Germany	Pigs	GI, GII	GII.18	17/120 (14)	RT-PCR	Mon431-434	F	Abattoirs #3	A	[41]
	Cattle	GIII	GIII.1	66/100 (66)	ELISA	VLPs of GIII.1 (AJ011099), GIII.2 (AF320625)	S	Farms #12	A	[93]
			GIII.2	87/100 (87)						
	Cattle		GIII.1	71/100 (71)			S	Farms #6	J	
			GIII.2	94/100 (94)						
	Cattle	norovirus	GIII.2	409/439 (93)	RT-PCR	NV32/NV36, NV33/NV35, JV12/JV13 BECF,BECR	F	Farms #29	J/A+	[95]
	Cattle	GIII.1	GIII.1	817/824 (99)	ELISA	VLPs of GIII.1 (AJ011099)	S	Farms #25	J/A	[94]
				34/381 (9)	antigen ELISA,	Anti-GIII.1 VLP hyperimune sera	F	Farms	+	
	Dogs	GVI.2	GVI.2	8/50 (16)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
	Dogs	all	GIV.2	13/294 (4)	RT-PCR	p298/p290, JV12Y/JV13I	F	Households	J+/-	[83]
	Rat[10]	all	GV	2/20 (10)	NGS		IC	Outdoors	NA	[96]
Switzerland	Dogs	GVI.2	GVI.2	2/10 (20)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
France	Dogs	GVI.2	GVI.2	10/50 (20)	ELISA	VLPs of GVI.2 (GQ443611)	S	Clinics	J/A	[47]
	Dogs	calicivirus	none	0/26 (0)	RT-PCR	p298/p290, JV12Y/JV13I	F	Households	J+/-	[83]
	Cattle	GIII	GIII.1/2	89/456 (20)	RT-PCR	CBECU-F/CBECU-R	F[c]	Farms #415	J+	[91]

	Cattle	GIII	GIII.1/2	29/81 (36)	RT-PCR	CBECU-F/CBECU-R	F[b]	Farms NA	J+	[92]
Africa										
South Africa	Pigs	calicivirus	none	0/120 (0)	RT-PCR	p290/p289	RS	Farms #2	J	[117]
Ethiopia	Pigs	calicivirus	none	0/117 (0)	RT-PCR	p290/p110, G2SKF/G2SKR	F	Households	J/A	[43]
Egypt	Cattle	GIII	GIII.2	6/25 (24)	RT-PCR	CBECU-F/CBECU-R	F	Farms #2	J+	[115]
Tunisia	Cattle	GIII	GIII.2	28/169 (17)	RT-PCR	CBECU-F/CBECU-R	F	Farms #17	J+	[116]
Asia (including Australia/New Zealand)										
China	Pigs	calicivirus	none	0/209 (0)	RT-PCR	p289/p290	F	Farms #6	J/A-	[33]
	Pigs	GII.11/18/19	GII.11 NA	-2/12 (17)	RT-PCR	not stated	RS	Farms #3	J+	[26, 27]
	Pigs	GII.11	GII.11	2/904 (0,2)	RT-PCR	p289/p290	F	Farms #14	J/A	[35]
	Dogs	NA	GVII	2/NA (NA)	NA	NA	RS	NA	NA	[194]
	Cattle	Bovine norovirus	GIII.1	3/28 (11)	RT-PCR	CBECU-F/CBECU-R	F	Farms #5	J+	[63]
	Bats	calicivirus	Not typed	NA	metagenomics	NA	RS	Outdoors	NA	[130]
	Bats	Not typed	Not typed	2/62 (3)	RT-PCR	Primers designed based on newly found virus	RS	Outdoors	A-	[64]
	Bats	norovirus	NA	10/235 (4)**	metagenomics	Primers designed based on newly found virus	IC	Outdoors	A-	[6]
	Brown rat	NA	GV	NA	RT-PCR	NA	RS	NA	NA	[195]
Taiwan	Pigs	calicivirus	GII.11	9/533 (2)	RT-PCR	p290/p110, NV2oF2/NV2oR, G2F3/G2SKR	F	Farms #6	J/A-	[34]
Japan	Pigs	GII.11		95/266 (36)	ELISA	VLPs of GII.11 (SW918)	S	NA	J	[46]
	Pigs	calicivirus	GII.11/18/19	36/240 (15)	RT-PCR, real-time RT-PCR	p289/p290, G1SKF/G1SKR, G2SKF/G2SKR qRT-PCR: COG2F/ALPF/COG2R	IC[a]	Farms #3 Abattoirs #1	A-	[36]
	Pigs	norovirus	GII.11	4/1117 (0.4)	RT-PCR	35/36 (SRSV), NV81/NV82	IC[3]	Farms #26	-	[10]
	Pigs	calicivirus	GII.11	1/24 (4)	RT-PCR	p289/p290	IC	Diagnostic lab #1	J+/-	[45]

	Dogs	calicivirus	GIV (NA)	2/97 (2)	RT-PCR	p290d/p289d	F	Households	+	[65]
	Cats		GIV.2	1/83 (1)						
	Cats	caliciviurs	GIV.2	1/NA (NA)	RT-PCR	p290d/p289d	RS	Shelter	-	[127]
	Mice [11]	GV	GV	6/44 (14)	RT-PCR	MNV-F1/MNV-R1, MNV-F2/MNV-R2	IC	Outdoors	NA	[66]
	Rat[12]		GV	1/1 (100)						
	Grass vole[5]		none	0/1 (0)						
Korea	Pigs	norovirus	GII.11/18	10/537 (2)	RT-PCR	GIIF2/GIIR, GIIF1/GIIF2, GIIF2/GIIR	F	Farms #64	J/A +/-	[67]
	Pigs	norovirus	GII.11/18	3/567 (0,5)	RT-PCR	NORO-DG35OF/IF	F	Farms #12	NA	[37]
	Dogs	Canine norovirus	GIV.2	14/459 (3)	RT-PCR	JV102/JV103	F/S	Clinic, Shelters	+/-	[68]
			GVI.2	68/427 (16)	ELISA	ELISA: p-domain of GVI.2 (GQ443611)				
	Cattle	GIII	GIII.1/2	60/645 (9)	RT-PCR	bovine norovirus-specific primers	F	Farms #629	J+	[69]
India	Cattle	GIII	GIII.1	1/249 (0,4)	RT-PCR	BEC-POL NBU-F/R CBECU-F/R, J11U/CBECU-R	F	NA	+	[13]
Iran	Cattle	GIII	GIII.1/2	100/253 (40)	RT-PCR	CBECU-F/CBECU-R	F[a]	Farms #42	J+	[70]
	Cattle	GI, GII	GIII	9/50 (18)	RT-PCR	Ni/E3	F	Farms #6	+	[71]
Turkey	Cattle	GIII	GIII.2	6/70 (9)	real-time RT-PCR	IIIBoVo-F/R	F	Farms	J+	[72]
	Cattle	GIII	GIII.2	5/127 (4)	RT-PCR	BoNoV851-F/BoNoV1350-R	RS	NA	J+	[73]
New Zealand	Pigs	GI-GIII	GII.11	2/23 (9)	RT-PCR	primers that detects GI-GIII	F	Farms #2	J-	[38]
	Cattle	GI-GIII	GIII.1	15/28 (54)	real-time RT-PCR	newly designed based on 52 NoV sequences	F	Farms #2	-	[75]
	Sheep	GI-GIII	GIII.3	8/33 (24)	RT-PCR	primers that detects GI-GIII	F	Farms #2	J-	[38]
Australia	Cattle	calicivirus	GIII.2	2/8 (25)	RT-PCR	p289/p290, CBECU-F/CBECU-R	PF	Farms	J+	[196]

[1] 64/312 (20%) in finisher pigs, 36/176 (20%) farms

[2] farms taken as n

[3] Caecum content

[4] House mouse (*Mus musculus*)

[5] Wood mouse (*Apodemus sylvaticus*)

[6] From carcass

[7] RNA from FFPE porpoise intestinal tissues

[8] Striped field mice (*Apodemus agrarius*)

[9] Yellow - necked mice (*Apodemus flavicollis*)

[10] Norway rat (*Rattus Norvegicus*)

[11] Japanese field mouse (*Apodemus speciosus*)

[12] Black rat (*Rattus rattus*)

[*] Used same set of veal calfs'

[**] 9/45 (20) and 1/44 (2,3) in two different region

Supplementary Table 2. Studies investigating human-to-animal transmission and the detection methods that were applied. Included are studies that analysed faecal samples for human norovirus sequences by RT-PCR or real-time RT-PCR or serological studies. Primers most often used are the universal calicivirus primer sets Some of the most frequently used primers are p289/p290 and p290/p110 (universal calicivirus primers, RdRp) and JV12/JV13 (norovirus specific). ELISA refers to serology ELISA. Unless otherwise stated sample were collected at one time point. a=longitudinal study, b=case-control, c=outbreak
A=adult (in pigs >6month), J=juvenile

Location	Host	Investigated genogroup/ Genotype	Human norovirus detected	Prevalence (%)	Detection method	Primers, Probes and antigens used	Sample collection		Age Clinical status Adult (A) Juvenile (J) Symptomatic (+) Asymptomatic (-)	Ref
							Sample type Faeces (F) Pooled Faeces (PF) Sera (S) Intestinal content (IC)	Locations (#)		
The Americas										
USA	Pigs	GI.1, GII.4	GI.1	57/110 (63)	ELISA	VLPS of GI.1, GII.1	S	Farms Abattoirs #1	NA	[46]
			GII.4	47/110 (52)						
		calicivirus	none	0/117 (0)	RT-PCR	P289H,I/p290H,I,J,K	F/IC	Farms #1 Abattoirs #2	J-	
		GI, GII	NA	2/104	Antigen ELISA	Hyperimmune sera against GI.1, GI.2, GI.3, GII.1, GII.3, GII.4 and GII.9	F	Farms #1	J-	
	Pigs	calicivirus	none	0/9 (0)[1]	RT-PCR	p290/p110, G2SKF/G2SKR	PF	Farms #9	A-	[28]
	Pigs	calicivirus	none	0/275 (0)	RT-PCR	p290/p110	F	Farms #6 Abattoirs #1	A-	[25]
	Pigs	calicivirus	none	0/139 (0)	RT-PCR	p290/p110	F	Farms #3	J	[48]
	Capuchin		none	0/5 (0)	ELISA	VLPs of GI.1, GII.4, GII.7	S		J/A-	[140]
			total	33/39 (85)						

	Mangabey	GI.1, GII.4, GII.7	GI.1	29/39 (74)				Research institute #1		
			GII.4	28/39 (72)						
			GII.7	15/39 (38)						
	Pigtail		total	11/17 (65)						
			GI.1	4/17 (24)						
			GII.4	4/17 (24)						
			GII.7	6/17 (35)						
	Rhesus		total	17/27 (63)						
			GI.1	11/27 (41)						
			GII.4	8/27 (30)						
			GII.7	4/27 (15)						
	Chimp		total	11/12 (92)						
			GI.1	11/12 (92)						
			GII.4	2/12 (17)						
			GII.7	0/12 (0)						
	Rhesus	calicivirus	Total	41/500 (8)	Real-time RT-PCR	Primers/probes specific for GI, GII, GIV	RS	Research institute #1	J+/-	[138, 139]
			GI.1	30/500 (6)						
			GII.7	8/500 (1,6)						
			GIV	3/500 (0,6)						
	Rhesus	GI.1	GI.1	114/188 (61)	ELISA	VLPs of GI.1, GII.5	S[a]	Research institute #1	J/A	[141]
		GII.5	GII.5	97/188 (52)						
	Cats	calicivirus	none	0/24 (0)	RT-PCR	p289/p290	F	Clinic #1 Shelter #1	J/A+/-	[53]
Canada	Pigs	calicivirus	none	0/20 (0)	RT-PCR	p289/p290	PF/F[2]	Farms #20, Abattoirs #2	J/A	[31]
	Pigs	norovirus	GII.4	4/120 (3)	RT-PCR	Region B and A primers, MON431-MON434, G1/G2	PF[a]	Farms #10	NA	[30]
	Cattle			1/179 (0,5)			PF	Farms #45	J/A	
Venezuela	Pigs	calicivirus	none	0/137 (0)	RT-PCR	p289/p290, GLPSG1/YGDDI1 GLPSG2/YGDD1	F	Farms #7	J +/-	[39]
Nicaragua	Pigs	GII.4 Dijon	GII.4 Dijon	96/137 (70)	ELISA	VLPs of GII.4 (GU325839, AF472623), GII.3 (AY247431)[3]	S	Households	J/A	[133]
		GII.4 HS194	GII.4 HS194	94/137 (69)						
		GII.3	GII.3	80/137 (58)						

Brazil	Pigs	calicivirus	none	0/96 (0)	RT-PCR	p289/289HI, p290/290HIJK, Mon431/432/433/434	RS	Farms #5	J/A +/-	[58]
	Pigs	calicivirus	none	0/261 (0)	RT-PCR	289/289HI, 290/290HIJK, Cap C/D3/D1	F/IC	Farms #6, Abattoirs #1	J/A +/-	[59]
	Pigs	calicivirus	none	0/169 (0)	RT-PCR	p289/p290	RS	Farms #5#	J+/-	[60]
	Primates[4]	calicivirus	none	0/62 (0)	RT-PCR	p289/p290	F	Outdoors	-	[197]
	Cats	calicivirus	none	0/29 (0)	Real-time RT-PCR	p289H/p290H, FNOV-09/FNOV-R15	F	Shelters #4	J+	[62]
Europe										
Italy	Pigs	calicivirus	none	0/290 (0)	RT-PCR	p290/p289/p110	F	Farms #17	J/A +/-	[77]
	dogs	calicivirus	GIV.2	0/183 (0)	RT-PCR	p289/p290, JV12Y/JV13I	F	NA	J+	[82]
	Dogs	GII.4	GII.4	52/516 (10)	ELISA	VLPS of GII.4 (AY032605), GIV.1 (AF414427)	S	Households	J/A	[80]
		GIV.1	GIV.1	3/516 (0,6)						
	Dogs	calicivirus	none	0/239 (0)	RT-PCR	p298/p290, JV12/JV13	F	Households	J+/-	[83]
	Cats	calicivirus	none	0/105 (0)	RT-PCR	p298/p290, JV12/JV13	F	Shelters #3	J+/-	[85]
Spain	Pigs	calicivirus	NA	0/221 (0)	Real-time RT-PCR, RT-PCR	p289/p290, JV12/JV13, For real-time RT-PCR probes for GI and GII	F	Farms #14, Abattoirs #1	J/A+/-	[86]
	Dogs	calicivirus	none	0/26 (0)	RT-PCR	p298/p290, JV12/JV13	F	Households	J+/-	[83]
Portugal	Dogs	calicivirus	none	0/105 (0)	RT-PCR	p298/p290, JV12/JV13	F	Shelters, shops, clinics	+/-	[89]
UK	Cattle	GI, GII	none	0/476 (0)	RT-PCR	NI/E3 (GII), GLPSG1/YGDD1 GLPSG2/YGDD1	F	Farms	J/A+	[198]
	Dogs	calicivirus	none	0/227 (0)	SYBR-based qPCR	p289/p290	F[b]	Clinics #4, Kennels	J/A+/-	[105]

	Dogs	GI, GII	none	0/248 (0)	Real-time RT-PCR	Primers to detect GI, GII	F[b]	Clinics #6, Shelter #1	J/A+/-	[106]
	Dogs	GI, GII	total	43/325 (13)	ELISA	Pooled VLPs for GI: GI.1, GI.2, GI.3 GII: GII.3, GII.4, GII.6, GII.12	S[b]	Kennel #1 veterinary college #1	NA	[106]
		GI	GI.1/2/3	8/325 (3)						
		GII	GII.3/4/6/ 12	20/325 (6)						
	Mice[5]	Norovirus	none	0/92 (0)	RT-PCR	general norovirus primers	F/RS[6]	Outdoors	NA	[107]
Ireland	Pigs	calicivirus	none	0/292 (0)	RT-PCR	p289/p290	F	Farms #4	J-	[40]
Netherlands	Pigs	norovirus	none	0/100 (0)	RT-PCR, Southern blot	primers designed based on human norovirus	PF	Farms #100	A	[9]
	Cattle	norovirus	none	0/118 (0)			PF	Farms #118	J/A	
	Primates[7]	GI, GII	none	0/201 (0)	RT-PCR,	JV12/JV13	F	Research Institute #1	+/-	[142]
				0/158 (0)	ELISA	VLPs of GI.1, GII.4 (1995)	S	Research institute #1	NA	[142]
	Chicken	norovirus	none	0/48 (0)	RT-PCR, Southern blot	primers designed based on human norovirus	PF	Broilers #48	J	[9]
Belgium	Pigs	calicivirus	none	0/43 (0)	RT-PCR	JV12/JV13, p289/p290	F	Diagnostic #1	J/A+/-	[99]
	Cattle	calicivirus	none	0/133 (0)	RT-PCR	JV12/JV13, p298/p290	F[a]	Diagnostic #1	J+	[100]
	Cattle	Norovirus	none	0/317 (0)	RT-PCR	JV12/JV13, CCV3/CCV4, CBECU-F/CBECU-R	F[a]	Farms	J/A+/-	[193]
Hungary	Pigs	calicivirus	none	0/17 (0)	RT-PCR	p289/p290	F	Farms #2	J/A+/-	[112]
	Dogs	calicviurs	none	0/63 (0)	RT-PCR	p289/p290	F	Shelter		[113]
	Rodents[8]	calicivirus	none	0/54 (0)	RT-PCR	p289/p290	PF	Outdoors	NA	[114]
Slovenia	Pigs	calicivirus	none	0/406 (0)	RT-PCR	p290/NVp110, JV12Y/JV13I	F	Farms #8	J/A-	[42]
	Cattle			0/119 (0)			F	Farms #4	J/A-	

						JV12Y/NVp110 G1SKF/R G2SKF/R				
Finland	Dogs	GI, GII, GIV	GII.4	3/92 (3)	Real-time RT-PCR	COG2R/QNIF2 QNIFS for GII, in house primers and QNIF4/QNIF3 for GI, Mon4F/Mon4R and Ring4 for GIV	F	Household	J/A+/-	[110]
			GII.12	1/92 (1)						
	Rats[9]	GI, GII	NA	2/100 (2)	Real-time RT-PCR	GII: COG2R/QNIF2 and QNIFS (probe) GI: QNIF4/QNIF3 and JJV1P (probe)	F/IC[6]	Dump sites #3	NA	[111]
	Mice[10]			0/88 (0)				Outdoors		
	Birds	GI, GII	Total	31/115 (27)			F[12]	Dump sites #1		
			GII.4	4/115 (4)						
			GII.3	2/115 (2)						
			GII[11]	19/115 (17)						
			GI[11]	6/115 (5)						
Denmark	Rats[8]	caliciv irus	GI.pb-GI.6	1/11 (9)	Real-time RT-PCR IEM	p289CVa/p289CVb p289CVc/p289CVd	IC[6]	Sewersystem #5	NA	[108]
Germany	Dogs	caliciv iurs	none	0/3 (0)	RT-PCR	p298/p290, JV12Y/JV13I	F	Households	J+/-	[83]
	Norway rat[11]	all	GV	0/20 (0)	NGS		IC	outdoors	NA	[96]
France	Dogs	caliciv irus	none	0/26 (0)	RT-PCR	p298/p290, JV12Y/JV13I	F	Households	J+/-	[83]
Europe	Dogs	GI.1, GII.4	GI.1	9/308 (3)	ELISA	VLPs of GI.1 (NC_001959), GII.4 (JQ478409.1)	S	Clinics	J/A	[47]
			GII.4	106/308 (34)						
Africa										
South Africa	Pigs	caliciv irus	NA	1/120 (1)	RT-PCR	p289/p290	RS	Farms #2	J	[117]
Ethiopia	Pigs	caliciv irus	GII.1	2/117 (2)	RT-PCR	p290/p110, G2SKF/G2SKR	F	Households	J/A	[43]
Asia (including Australia/New Zealand)										
China	Pigs	caliciv irus	none	0/209 (0)	RT-PCR	p289/p290	F	Farms #6	J/A-	[33]
	Pigs	caliciv irus	none	0/904 (0)	RT-PCR	p289/p290	F	Farms #14	J/A	[35]

	Macaques[13]	calicivirus	GII.17	16/50 (32)	RT-PCR	GII.17 specific primers	F	Farm #1	NA	[136]-[137]
Taiwan	Pigs	calicivirus	GII.2/4	82/533 (32)	RT-PCR	p290/p110, NV2oF2/NV2oR, G2F3/G2SKR	F	Farms #6	J/A-	[34]
Japan	Pigs	calicivirus	Total	11/354 (3)	RT-PCR, Real-time RT-PCR	p289/p290, G1SKF/G1SKR G2SKF/G2SKR . Real-time RT-PCR primers: COG2F/ALPF/COG2R	IC[a]	Farms #3 Abattoirs #1	A-	[36]
			GII.3	4/240						
			GII.4	7/240						
			GII.13	1/240						
	Pigs	SRSV	none	0/1117 (0)	RT-PCR	35/36 (SRSV), NV81/NV82	IC[2]	Farms #26	-	[10]
	Pigs	calicivirus	none	0/24 (0)	RT-PCR	p289/p290	IC	Diagnostic #1	J+/-	[45]
	Dogs	caliciviurs	none	0/97 (0)	RT-PCR	p290d/p289d	F	Households	+	[65]
	Cats			0/83 (0)						
Korea	Pigs	GII	none	0/537 (0)	RT-PCR	GIIF2/GIIR (GII)	F	Farms #64	J/A +/-	[67]
	Pigs	Norovirus	none	0/576 (0)	RT-PCR	NORO-DG35OF/IF	F	Farms #12	NA	[37]
Iran	Cattle	GI, GII	NA	9/50 (18)	RT-PCR	Ni/E3	F	Farms #6	+	[71]
New Zealand	Pigs	GI, GII	none	0/23 (0)	RT-PCR	GI-GIII primers	F	Farms #2	J-	[38]
	Sheep			0/33 (0)				Farms #2	J-	
	Cattle	GI, GII	none	15/28 (0)	real-time RT-PCR	newly designed based on 52 norovirus sequences	F	Farms #2	-	[75]
Australia	Cattle	calicivirus	none	0/6 (0)	RT-PCR	p289/p290	PF	Farms	J-	[196]

[1] Number of farms (n)

[2] Caecum content

[3] From chronic patient

[4] Red-howler (*Alouatta seniculus*), Commo marmosets (*Callithrix jacchus*, free-ranging), Black-faced lion tamarin (*Leontopithecus caissara*)

[5] *Mus musculus*

[6] From carcass

[7] Chimpanzees *(Pan troglodytes)*, Rhesus macaque (*Macaca mulatta*), Cotton top tamarins (*Saguinus Oedipus*), Cynomolgus macaque (*Macaca fascicularis*), Common marmoset

[8] Mice (*Apodemus agrarius*), Yellow necked mouse (*Apodemus flavicollis*), bank voles (*Myodes glareolus*)

[9] Norway rat *(Rattus norvegicus)*

[10] Yellow necked mouse (*Apodemus flavicollis*)

[11] Could not be sequenced

[12] Collected from untouched fresh snow

[13] Rhesus/Pigtail/cynomologus

Supplementary Table 3. Summary of VLP attachment studies. Shown are the putative norovirus hosts for which attachment studies have been conducted. Their HBGA was extracted from papers that were chosen for the review. No additional papers were included.

Host	HBGA phenotype (determined from)	VLPs (accession number)	Binding detected	No binding detected	Ref
Human	A+/B+/H1+/H2+/H3+/ Lewa+/Lewb+/Lewx+/Lewy+	GII.4 (AAK84679) GII.5 (AF397156) GII.9 (AY038599)	PGM, PGIT	NA	[199]
		GI.1	PGM, PGIT[3,4] Epithelial cells of pig intestinal tissue	NA	
		GI.1 (JX023285)	Type II/III PGM[4]	NA	[200]
		GI.1, GI.3, GII.1, GII.3, GII.4	Porcine buccal and duodenal tissue[3]	GI.3 did not bind	[146]
		GI.1 NC_001959.2) GII.4 (AF472623)	Canine saliva/duodenal scrapings of secretors Canine duodenal tissue (antigen-A independent)	Human saliva of non-secretors	[106]
		GI.3 (KP064096) GII.3 (KP064097) GII.6 (KP064098) GII.12 (KP064099)	Canine duodenal scrapings of secretors	NA	[106]
		GII.4 (Dijon 171/96)	Human saliva of secretors	Bovine erythrocytes	[177]
		GII.4 (GU325839, AF472623), GII.3 (AY247431)	Type III PGM[3]	NA	[133]
		GII.1	NA	Bovine cell lines	[201]
		GI.1	Erythrocytes of chimpanzees	Erythrocytes of baboon, spider monkey, rhesus macaque, chicken, guinea pig, murine, canine, bovine, porcine, feline, and lapine	[202]
Pig	A+/H1+/H2+/Lewb+ (PGM/PGIT, tissue)	GII.11	NA	52 human saliva (representing all major HBGA types)	[46]
Cattle	A+/B-/H2+/Ley+/H1-/H3-/Lewa+[2] (fixed tissue)	GIII.2 (AF097917)	Bovine intestinal tissue (stomach, duodenum), bovine eryhthrocytes Bovine saliva Porcine intestinal tissue (non-epithelial cells) 2/44 synthetic glycans: (alpaGal-Lex, alphaGal tri, both have a terminal alpha 1,3 galactose	Human saliva (A/B/O types)/ intestinal tissue 42/44 synthetic glycans tested	[177]
		GIII.2 (EU794907)	Bovine cell lines[1]	NA	[201]

Bat	NA	Bat norovirus (KJ790198)	H1, H3, A, B, 2,6-sialic acid (highest) (at 3 different temperatures)	H2, -2,3-sialic acid Lew a,b,x,y	[129]
Rhesus macaques	A+/B+/Lewb+/Lewx+/Lewy+/Lewa- (saliva)	GII.17 (KX356908)	Human saliva	NA	[136, 138, 139]
Dog	H2+/A+/B-/Lewy+/Lewa-/Lewb-/Lewx- (saliva, intestinal scraping)	GVI.2 (GQ443611) GVI.1 (FJ692501) GIV.2 (EU224456.1)	Canine tissue (antigen-A independent)[3,5] 4/20 synthetic glycans: H1, A hepta, Lewb, Sial LNF V (1,2 fucose)	16/20 synthetic glycans	[176]
		GVI.2 (GQ443611)	Canine/human saliva of secretors	Human saliva of non-secretors	[176]
Cats	NA	GIV.2 (JF781268)	NA	30 synthetic glycans	[203]

[1] Madine-darby kidney cells (MDBK), bovine turbinate cells, embryonic bovine tracheal cells, Georgia bovine kidney cells, embryonic bovine lung cells, Mac T-cells (udder origin), bronchial cells, Bomac cells (macrophagic origin), jejunocytes

[2] only in goblet cells of duodenum and colon

[3] Blocking experiments were carried out

[4] VLP binding was abolished with KIO4 pre-treatment (oxidizes carbohydrates)

[5] Pre-treatment with 1,2-alpha-fucosidase diminished VLP binding to tissue (removes the fucose group from the H antigen)

[6] Isolated from rhesus macaques

PGM = Pig intestinal mucin, PGIT = pig gastrointestinal tissue washing, NA=not applicable

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