

The way of Virus Spread

Table 1. Characteristics of Patients with Novel Coronavirus–Infected Pneumonia in Wuhan as of January 22, 2020.*			
Characteristic	Before January 1 (N = 47)	January 1 –January 11 (N = 248)	January 12 –January 22 (N = 130)
Median age (range) — yr	56 (26–82)	60 (21–89)	61 (15–89)
Age group — no./total no. (%)			
<15 yr	0/47	0/248	0/130
15–44 yr	12/47 (26)	39/248 (16)	33/130 (25)
45–64 yr	24/47 (51)	106/248 (43)	49/130 (38)
≥65 yr	11/47 (23)	103/248 (42)	48/130 (37)
Male sex — no./total no. (%)	31/47 (66)	147/248 (59)	62/130 (48)
Exposure history — no./total no. (%)			
Wet market exposure	30/47 (64)	32/196 (16)	5/81 (6)
Huanan Seafood Wholesale Market	26/47 (55)	19/196 (10)	5/81 (6)
Other wet market but not Huanan Seafood Wholesale Market	4/47 (9)	13/196 (7)	0/81
Contact with another person with respiratory symptoms	14/47 (30)	30/196 (15)	21/83 (25)
No exposure to either market or person with respiratory symptoms 没有和市场或有呼吸道症状人接触	12/27 (26)	141/196 (72)	59/81 (73)
Health care worker — no./total no. (%)	0/47	7/248 (3)	8/122 (7)

* Reduced denominators indicate missing data. Percentages may not total 100 because of rounding.

图1. 大部分（70%以上）新冠患者并没有和有呼吸道症状的人接触(1)

Basic Information:

How long can new coronaviruses survive? At present, due to the relatively short time of virus emergence, there are not many research reports available for reference, but with reference to the study of the closest pathogenic coronavirus-SARS virus (SRAS-CoV), neocoronavirus can survive for 4 days at room temperature Above (Figure 2), and its survival time will be further extended under low temperature drying conditions. High temperature (56 ° C, 1 hour) (Figure 3), UV (about 1/10 of sunlight UV intensity, 30 minutes) (Figure 4) (3) and alcohol (the most effective common disinfectant) (Figure 5) (4) Can effectively disinfect.

Documents and banknotes belong to printing paper in terms of material classification. From the experimental results (Figure 2), the virus inventory time exceeds 96H. If not disinfected, such objects will become due to their own ultra-high fluidity. Potential infectious agents bring many variables to the prevention and control work.

To this end, relevant departments have issued documents requiring banks to circulate currency in high temperature or ultraviolet disinfection.

How long virus survive:

Stability of SARS Coronavirus in Human Specimens and in Environments at Room Temperature																	
		12 h		24 h		36 h		48 h		60 h		72 h		96 h		120 h	
Serum	血清	+++	+++	+++	+++	+++	+++	+++	+++	++	++	++	++	+	+	-	-
Sputum	痰	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	++	++	+	+
Filtrated Sputum		+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	++	++	+	+	-	-
Feces	粪便	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	++	++	+	+
Filtrated Feces		+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	++	++	+	+
Urine	尿液	+	+	+	+	+	+	+	+	+	+	+	+	+	±	±	±
Wood Board	木板	+	+	+	+	+	+	+	+	+	+	±	±	±	-	-	-
Glass	玻璃	+++	+++	+++	+++	+++	+++	+++	+++	++	++	+	+	±	±	-	-
Mosaic	地板	++	++	++	++	++	++	++	++	++	++	+	+	-	-	-	-
Metal	金属	++	++	++	++	++	++	++	++	++	++	++	++	+	+	±	±
Cloth	衣物	++	++	++	++	++	++	++	++	++	++	++	++	+	+	±	±
Press Paper	打印纸	++	++	++	++	++	++	++	++	++	++	+	+	±	±	-	-
Filter Paper	滤纸	++	++	++	++	++	++	++	++	++	++	++	++	+	+	±	±
Plastic	塑料	++	++	++	++	++	++	++	++	++	++	+	+	±	±	-	-
Water	水	++	++	++	++	++	++	++	++	++	++	++	++	+	+	-	-
Soil	泥土	+	+	+	+	+	+	+	+	+	+	+	+	±	±	-	-
Cell Control		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Virus Control (4℃)		+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Virus Control (RT)		++	++	++	++	++	++	++	++	++	++	++	++	+	+	-	-

Note. CPE of infected cells was determined 48 h postinfection. +: less than 25% cells with CPE, ++: 26%-50% cells with CPE, +++: 51-75% cells with CPE, ±: only few cells with CPE, -: without detectable CPE.

图2. 非典病毒在体外的存活时间可达4天以上（常温）（3）

How long virus survive:

Stability of SARS Coronavirus in Various Temperature Environments												
	4℃		20℃		37℃		56℃		67℃		75℃	
15 min	+++	+++	+++	+++	+++	+++	+++	+++	++	++	+	+
30 min	+++	+++	+++	+++	+++	+++	+++	+++	+	+	-	-
60 min	+++	+++	+++	+++	+++	+++	++	++	-	-	-	-
90 min	+++	+++	+++	+++	+++	+++	-	-	-	-	-	-
120 min	+++	+++	+++	+++	+++	+++	-	-	-	-	-	-
Cell Control	-	-	-	-	-	-	-	-	-	-	-	-
Virus Control	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++

Note. CPE of infected cells was determined 48 h postinfection. +: less than 25% cells with CPE, ++: 26%-50% cells with CPE, +++: 51%-75% cells with CPE, ±: only few cells with CPE, -: without detectable CPE.

图3. 56℃60min可有效灭活非典病毒(3)

How long virus survive:

Stability of SARS Coronavirus Under Different Exposure Times of UV

	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6
15 min	+	+	+	+	+	+
30 min	±	±	±	±	±	±
60 min	-	-	-	-	-	-
90 min	-	-	-	-	-	-
120 min	-	-	-	-	-	-
150 min	-	-	-	-	-	-
Cell Control	-	-	-	-	-	-
Virus Control	+++	+++	+++	+++	+++	+++

Note. CPE of infected cells was determined 48 h postinfection. +: less than 25% cells with CPE, ++: 26%-50% cells with CPE, +++: 51%-75% cells with CPE. ±: only few cells with CPE. -: without detectable CPE.

图4. 紫外 ($>90\mu\text{W}/\text{cm}^2$; 大约1/10正午紫外线强度) 可有效灭活非典病毒(3)

How long virus survive:

Treatment	Virus titre (TCID ₅₀ /ml [log10]) (after contact time of x s)	Minimal reduction factor (log10) 数值越大，消毒效果越好
2-Propanol ^a (100%)	$\leq 1.8 \pm 0$ (30 s)	≥ 3.31
2-Propanol ^a (70%)	$\leq 1.8 \pm 0$ (30 s)	≥ 3.31
Desderman ^b (78% ethanol) 78%酒精	$\leq 1.8 \pm 0$ (30 s)	≥ 5.01
Sterillium ^c (45% 2-propanol, 30% 1-propanol)	$\leq 3.8 \pm 0$ (30 s)	≥ 2.78
Wine vinegar ^d	$\leq 2.80 \pm 0$ (60 s)	≥ 3.0
Formaldehyde (0.7%) ^b	$\leq 3.8 \pm 0$ (120 s)	≥ 3.01
Formaldehyde (1.0%) ^b	$\leq 3.8 \pm 0$ (120 s)	≥ 3.01
Glutardialdehyde (0.5%) ^b	$\leq 2.8 \pm 0$ (120 s)	≥ 4.01
Incidin plus ^e (2%) (26% glucoprotamin)	$\leq 4.8 \pm 0$ (120 s)	≥ 1.68

图5. 酒精是对非典病毒最有效的消毒剂(4)

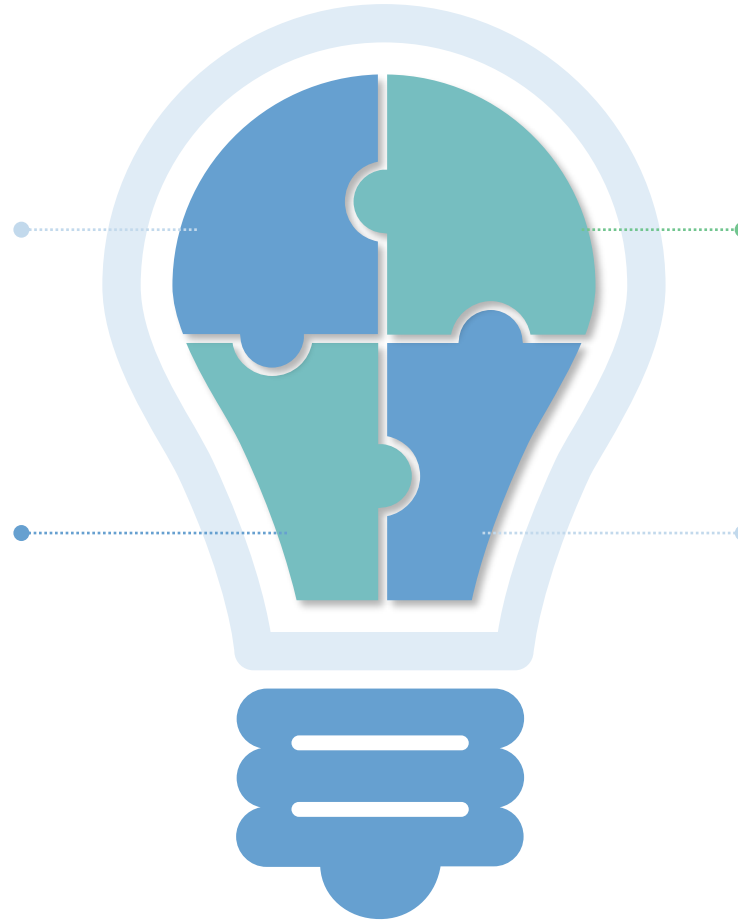
Virus inactivation

UV

About 1/10 sunshine light
For 30mins

Disinfectant

75% alcohol, hydrogen peroxide
disinfectant, chloroform and other
fatty solvents



Sensitive to high temperature
Over 56°C, over 36mins