

APPENDIX

Supplementary Table I. Summary of main findings of studies on combined psychological and coping responses among emerging ID (SARS, Ebola, H1N1) outbreaks.

No.	Author (yr)	ID	Population	Sociodemographic features	Method and Measures used	Main Findings
1	Main et al (2011)	SARS	Undergraduate students from 2 public universities in Beijing	381 undergraduate students, 42.5% M Mean age: 20.16 ± 1.46 yr • 238 first-year students (60.8%) • 63 sophomores (16.1%) • 47 juniors (12.0%) • 43 seniors (11.0%)	Self-report using an anonymous survey relating to: • SARS-related stressors • Coping strategies • Psychological symptoms • Perceived general health • Life satisfaction	Psychological responses Main effect of SARS-related stressors was a positive and significant predictor of psychological symptoms (somatisation, obsessive-compulsive, depressive and phobic/anxiety symptoms) Coping responses Avoidant coping ($\beta = 0.24, p \leq 0.001$) and seeking social support coping ($\beta = 0.14, p \leq 0.001$) positively predicted psychological symptoms when controlling for SARS-related stressors and covariates
2	Dodgson et al (2010)	SARS	Women who became mothers during the SARS outbreak in Hong Kong in 2003	8 Chinese mothers living in Hong Kong who delivered healthy newborn infants during the SARS outbreak Age range: 28–38 (34.29 ± 3.20) yr 6 (75%) participants were first-time mothers	Qualitative study to discuss experiences of being pregnant and delivering their baby during the SARS epidemic	Psychological responses • Living with uncertainty • Intense vigilance • Social isolation • Disrupted expectations Coping responses Problem-focused coping
3	Peng et al (2010)	SARS	Nationwide representative sample of residents ≥ 18 yr	1,278 residents recruited in November 2003, 4 months after resolution of the SARS crisis in Taiwan 643 (50.3%) M, 635 (49.7%) F Mean age: 41.6 ± 16.6 yr	• Perceptions and attitudes towards SARS • Behaviour and SARS-related experiences • Psychological distress (single-item measure of degree of distress + Brief Symptom Rating Scale, i.e. BSRS-5)	Psychological responses • 9.2% reported that they had become more pessimistic • Sleep disturbance (4.2%), anxiety (3.2%), depression (3.0%), inferiority (2.9%), hostility (2.3%) • 9.7% of participants reported that they or their relatives/friends had encountered SARS-related discrimination. Coping responses Decreased preparedness increases pessimism
4	Sim et al (2010)	SARS	General public who visited community healthcare centres in Singapore during the 2003 SARS outbreak	415 respondents from community healthcare setting (78% response rate) 246 (59.3%) M Mean age: 36.6 ± 13.9 yr 317 (76.4%) went to polyclinics for upper respiratory tract infection	• General Health Questionnaire (i.e. GHQ-28) • Impact of Events Scale-Revised (i.e. IES-R) • DSM-IV to determine presence of post-traumatic stress disorder • Brief COPE questionnaire	Psychological responses • Psychiatric morbidity present in 22.9% of participants • 25.8% had high levels of post-traumatic stress symptoms Coping responses • Those with psychiatric morbidity used all coping measures more frequently than those without • High levels of post-traumatic stress symptoms associated with increased use of denial and planning as a coping strategy
5	Mak et al (2009)	SARS	SARS survivors (Hong Kong Chinese) from Prince of Wales hospital and Amoy Garden. Prince of Wales was the hardest-hit hospital. Amoy Garden was the hardest-hit residential area during SARS crisis.	143 SARS survivors 53 M, 90 F Mean age: 38.4 ± 12.4 yr 32.9% were healthcare workers 30.1% received psychological counselling after getting SARS	Medical Outcomes Study Social Support Survey (i.e. MOS-SSS) • Tangible support • Affectionate support • Positive social interaction • Emotional/informational support Strategies Used by Patients to Promote Health (i.e. SUPPH) • Positive attitude • Stress reduction • Making decisions SF-36 (36-item Short Form) Health Survey • Mental health • Role-emotional • Social functioning	Psychological responses • Educational level was a significant predictor of mental health status – higher education predicted better mental health ($p < 0.01$) • All indicators of medical staff support and perceived family/friend support were positively correlated with all indicators of mental health status (range 0.20–0.48) Coping responses • Social support and self-efficacy were associated with better psychological adjustment • Suggests that a major component in psychological treatment for survivors of SARS and infectious diseases is to provide healthcare providers and individuals' social support network with specific skills that aim to enhance the patients' perceived efficacy in self care

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6	Puterman et al (2009)	SARS and West Nile Virus	General population in Canada	SARS sample: 269 West Nile virus sample: 191	<ul style="list-style-type: none"> Health behaviours (avoiding people and taking recommended health precautions) Wishful thinking and relationship-focused coping subscale from the brief Ways of Coping scale Perception of SARS threat Empathic coping Spielberger's updated version of measure of state anxiety 	<p>Psychological responses</p> <p>Anxiety</p> <p>Coping responses</p> <ul style="list-style-type: none"> For both samples, perception of threat, coping (empathetic responding and wishful thinking) and health behaviours were all positively related to one another Individuals higher in threat perception were more likely to report employing both modes of coping and engaging in greater health behaviours
7	Chan et al (2007)	SARS	Parents of highly suspected SARS paediatric patients in Hong Kong between March 20 and May 28, 2003	7 parents (response rate of 41%) of highly suspected SARS patients	Qualitative, semi-structured interviews	<p>Psychological responses</p> <p>Fear of immediate isolation and infection control procedures, fear of phone calls from hospital</p> <p>Coping responses</p> <p>Distractions (going out and buying child's favourite foods); most parents did not seek support from other family members, believing that the community was already stressed because of SARS, brought personal items to the hospitalised child frequently</p>
8	Chiang et al (2007)	SARS	Nurses caring for patients with SARS during the outbreak in Taipei and were infected	21 nurses (15 ER nurses, 6 from respiratory ICUs) Age: 21–43 yr	4 focus group sessions	<p>Psychological responses</p> <p>Concerns about health of self/family</p> <p>Coping responses</p> <p>Ethical love prompted nurses to think about caregiving in a new light; caregiving with compassion, collaboration with staff</p>
9	Siu et al (2007)	SARS	Qigong followers suffering from chronic health problems, interviewed during SARS outbreak from March to June 2003 in Hong Kong	2 kinds of participants: (a) observation only and (b) interviews + observation of 98 senior qigong followers (started qigong since Nov 2002) and 70 new followers (enrolled since SARS outbreak) <ul style="list-style-type: none"> 30 consented to participate in interviews (10 M, 20 F) 122 observation participants (122 F, 16 M) 160 (95.2%) of the participants were aged 40–50 yr Common health problems included hypertension, diabetes mellitus, heart disease, musculoskeletal problems, cancer and kidney disease	In-depth semi-structured interviews	<p>Psychological responses</p> <ul style="list-style-type: none"> Social stigmatisation of and discrimination against the chronically ill Sense of insecurity and uncertainty as a result of their beliefs of high vulnerability <p>Coping responses</p> <p>Practising qigong, seeking social support</p>
10	Yeung et al (2007)	SARS	Nationwide sample age: ≥ 18 yr	<p>Phase 1</p> <p>741 responded (62.5% response rate) to the survey conducted between March and April 2003 when the SARS outbreak was most serious in Hong Kong</p> <ul style="list-style-type: none"> Younger group (18–35 yr), n = 351 Middle-aged group (36–55 yr), n = 201 Older group (> 56 yr), n = 189 62% F <p>Phase 2</p> <p>385 (52%) participants from Phase 1 participated in Phase 2, which was carried out between May and June 2003 after the SARS outbreak had ended</p>	Emotional responses (extent they felt sadness, fear, anger, and shock) Brief COPE questionnaire	<p>Psychological responses</p> <ul style="list-style-type: none"> Older adults had lowest level of anger in both phases (2.13 ± 1.46 in Phase 1 and 1.57 ± 1.07 in Phase 2) Younger (2.54 ± 1.28) and middle-aged adults (2.02 ± 1.48) experienced the highest levels of anger in Phase 1 and 2 respectively <p>Coping strategies</p> <ul style="list-style-type: none"> Younger adults (2.11 ± 0.77) used greater emotion-focused coping than older (1.77 ± 0.54) and middle aged adults (1.83 ± 0.62) at Phase 1 Older adults (2.92 ± 0.54) used more emotion-focused coping than younger adults (2.72 ± 0.50) at Phase 2

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11	Cheng et al (2006a)	SARS	SARS survivors, family members, and a non-affected sample from Hong Kong	Qualitative interview and quantitative survey <ul style="list-style-type: none"> 70 SARS survivors (33 M, 37 F) 59 family members (24 M, 35 F) of SARS survivors 172 healthy adults (75 M, 97 F) not affected by SARS outbreak 	<ul style="list-style-type: none"> Qualitative interview and quantitative survey Marlowe–Crowne Social Desirability Scale measured defensiveness/denial Rosenberg Self-Esteem Scale Inventory of Socially Supportive Behaviours measured social support received 	<p>Psychological responses</p> <p>Defensiveness</p> <p>Coping responses</p> <p>Seeking social support</p>
12	Cheng et al (2006b)	SARS	Hong Kong Chinese SARS survivors, including healthcare workers	57 Hong Kong Chinese SARS survivors who were discharged from Princess Margaret Hospital for 2–6 months <ul style="list-style-type: none"> 38 F (66.7%) and 19 M (33.3%) 38.1 ± 10.4 yr 22 (38.6%) were healthcare workers 	<ul style="list-style-type: none"> Beck Depression Inventory Beck Anxiety Inventory SARS Appraisal Inventory <ul style="list-style-type: none"> Perceived impact of SARS (primary appraisal) Coping efficacy (secondary appraisal) Higher scores = more negative appraisal Post-traumatic growth measured using Thriving Scale <ul style="list-style-type: none"> Personal growth Spiritual growth Relationship growth 	<p>Psychological responses</p> <ul style="list-style-type: none"> Scores on SARS Appraisal Inventory were positively correlated with scores on Beck Depression Inventory and Beck Anxiety Inventory, and negatively correlated with perceived health Post-traumatic growth scores were negatively correlated with depression scores, non-significantly with anxiety symptoms, and positively with perceived health Healthcare workers had higher anxiety ($t = 2.53, p < 0.05$) and depression scores ($t = 2.03, p < 0.05$) <p>Coping responses</p> <p>'Perceived impact' and 'coping efficacy' had direct effects on Beck Depression Inventory, Beck Anxiety Inventory and perceived health</p>
13	Cheng & Cheung (2005)	SARS	Hong Kong undergraduates assessed at 4 time points (4 weeks) + 1 at baseline (previous study)	72 Hong Kong Chinese undergraduates 31 M, 41 F Mean age: 21.14 ± 0.99 yr	<ul style="list-style-type: none"> State-Trait Anxiety Inventory Coping Flexibility Inventory <ul style="list-style-type: none"> Controllable events Uncontrollable events Strategies for coping with SARS (based on previous elicitation study) <ul style="list-style-type: none"> Personal hygiene practice Lifestyle habits Information seeking Avoidance 	<p>Psychological responses</p> <ul style="list-style-type: none"> Trait anxiety was able to predict fluctuations in state anxiety across timepoints ($p < 0.05$) However, the positive association between trait and state anxiety was only present at initial time points Individual differences in state anxiety became minimal at subsequent time points <p>Coping responses</p> <ul style="list-style-type: none"> Situation-specific coping strategies of personal hygiene practice ($p < 0.05$) and avoidance ($p = 0.001$) were found to predict fluctuations in state anxiety more than lifestyle habits and information-seeking behaviour Individuals who used more avoidant coping strategies experienced less state anxiety ($\beta = -0.57$)
14	Lee et al (2005)	SARS	15 residents, 4,896 households in Amoy Gardens	903 completed questionnaires (18.5% response rate) <ul style="list-style-type: none"> 41% M Mean age: 31.9 yr 5.2% ex-SARS patients 7.7% had confirmed SARS cases in their households 15 residents for focus group 	Two focus groups with 15 residents in Amoy Gardens Self-report questionnaire generated from a content analysis of the focus groups (experience of stigma and coping, psychosomatic symptoms)	<p>Psychological responses</p> <ul style="list-style-type: none"> Rejection from dining by friends (40.6%), discrimination by employers (48.7%), persistent low mood (73.1%), irritability (56.7%), insomnia (34.2%) <p>Coping responses</p> <p>Avoid outbreak areas, conceal residential status</p>
15	Mok et al (2005)	SARS	Nurses who contracted SARS in Hong Kong	10 nurses (2 M, 8 F)	Qualitative study	<p>Psychological responses</p> <p>Anxiety due to uncertainty about the disease, fear of death, sense of powerlessness and loss of control, feelings of anger and guilt, isolation and loneliness</p> <p>Coping responses</p> <p>Social support, religious practices, faith, prayer, reflection</p>
16	Qian et al (2005)	SARS	College students in Beijing and Suzhou who were under different external stressors during the SARS outbreak in China from 22 April to 23 June 2003	<ul style="list-style-type: none"> 268 college students in Beijing (141 M, 127 F) Age: 22.73 ± 2.90 yr 397 undergraduates from Suzhou Medical University (176 M, 221 F) Age: 20.6 ± 1.2 yr 	Psychological responses questionnaire on SARS	<p>Psychological responses</p> <p>College students in Beijing showed higher scores for negative cognitions and negative emotions towards SARS than those in Suzhou ($p < 0.001$)</p> <p>Coping responses</p> <p>More coping behaviours in Beijing sample than Suzhou sample ($p < 0.001$) (e.g. wearing face mask, monitoring temperature)</p>

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17	Cheng et al (2004)	SARS	SARS survivors after 1-month recovery	100 SARS survivors (37.2% response rate) <ul style="list-style-type: none"> • Mean age: 37.14 ± 12.09 yr • 66 F, 34 M • 18% healthcare workers 184 community subjects (92% response rate) <ul style="list-style-type: none"> • Mean age: 34.51 ± 8.71 yr • 111 F, 73 M • 10.9% healthcare workers 	<ul style="list-style-type: none"> • General Health Questionnaire-28 (i.e. GHQ-28) • Rosenberg Self-Esteem Scale • World Health Organization Quality of Life measure abbreviated version • Severity of SARS symptoms • Level of social support 	<p>Psychological responses</p> <ul style="list-style-type: none"> • 68% of SARS survivors were identified as distressed using a cutoff score of 5, compared to 34.8% in the community sample (OR 2.89, 95% CI 1.73–4.82, p < 0.001) • SARS survivors had elevated scores in the GHQ-28 and 3 subscales (somatic symptoms, anxiety-insomnia, social dysfunction) as compared to the community subjects • SARS survivors had lower quality of life (total, physical, psychological and environment) as compared to community subjects <p>Coping responses</p> <p>Social support</p>
18	Leung et al (2003)	SARS	Community sample in Hong Kong, conducted at the height of the SARS outbreak from 29 March to 6 April 2003	1,115 Hong Kong adult residents (76.4% response rate) 42.9% M	Survey	<p>Psychological responses</p> <ul style="list-style-type: none"> • Mean anxiety level = 2.24 (on a scale of 1 to 4, with 4 being 'very anxious') • 1 (12.6%) in 8 respondents had a mean score of ≥ 3, indicating they were 'quite'/'very' anxious <p>Coping responses</p> <p>Adoption of precautionary measures</p>
19	Schwerdtle et al (2017)	Ebola	Adult males and females who contracted Ebola, became sick, survived between 2014 and 2015, and were treated in an Ebola treatment centre	Group 1: 6 participants who were members of a rural community from Sierra Leone (set up their own Ebola survivor self-help group which ran from an empty healthcare centre) Group 2: 12 participants who were members of a small rural village in Sierra Leone that suffered a loss of 10% of the village population due to the outbreak Group 3: 7 participants from an urban setting in Liberia and who were mostly admitted around the peak of the outbreak between July and September 2014 Total: 25	Qualitative semi-structured group interview, one group at a time	<p>Psychological responses</p> <ul style="list-style-type: none"> • Multiplicity of deaths causing grief, loss • Sense of abandonment, stigmatisation <p>Coping responses</p> <ul style="list-style-type: none"> • Self and community protection and care • Seeking complementary medicine, strength in religion • Coping resources and activities – running away to another town, seeking complementary medicine, treating patients at home when healthcare services were not accessible
20	Rabelo et al (2016)	Ebola	Survivors of Ebola treated at an Ebola Treatment Unit (ETU) managed by Médecins Sans Frontières	Group 1: 9 female survivors of Ebola Group 2: 8 male survivors Group 3: 6 male survivors from Group 2	Qualitative study, focus group discussions after discharge	<p>Psychological responses</p> <ul style="list-style-type: none"> • Concerns about family life outside the ETU, isolation, uncertainty • Loss of sense of reality in the ETU, loss of loved ones, possessions, depression • Stigmatisation • Post-traumatic stress <p>Coping responses</p> <p>Seeking support from religious leader, peer, staff, family, friends</p>
21	Matua & Van der Wal (2015)	Ebola	Survivors and family caregivers after an Ebola outbreak in Kibale District, Western Uganda	12 adult survivors and their family caregivers 5 survivors – mean age: 38 yr 7 caregivers – mean age: 33 yr	In-depth semi-structured qualitative interviews	<p>Psychological responses</p> <ul style="list-style-type: none"> • Fear, ostracism and stigmatisation • Helplessness and desperation • Social isolation, fear and sadness • Psychosomatic manifestations <p>Coping responses</p> <ul style="list-style-type: none"> • Seeking self-preservation and protection • Positive attitude and prayer
22	Joffe & Haarhoff (2002)	Ebola	Examines how British broadsheet and tabloid readers make sense of the Ebola outbreak in Africa in the mid-1990s	50 respondents: 20 tabloid and 30 broadsheet readers 50% M in each group Mean age: 48.2 ± 6.7 yr All participants were white and British	Semi-structured, depth interview	<p>Psychological responses</p> <p>Air of superiority</p> <p>Coping responses</p> <p>Distancing (Ebola and 'the Other')</p>

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23	Taha et al (2014)	H1N1	Individuals recruited from online sites from 8 October 2009 to 29 November 2009 during the peak of the H1N1 epidemic	1,027 individuals ≥ 18 years old 748 (72.83%) F – age: 32.37 ± 10.23 yr 279 (27.17%) M – age: 31.08 ± 10.38 yr	<ul style="list-style-type: none"> • Intolerance of uncertainty • Stress appraisal • Coping scale • State-trait anxiety inventory 	<p>Psychological responses</p> <ul style="list-style-type: none"> • Anxiety, uncertainty <p>Coping responses</p> <ul style="list-style-type: none"> • Problem and emotion-focused coping • H1N1 anxiety was directly predicted by threat and self-control appraisals and endorsement of emotion- and problem-focused coping
24	McCauley et al (2013)	H1N1	Participants aged ≥ 25 yr from various ethnic, racial and socioeconomic positions in New England	16 participants from City A <ul style="list-style-type: none"> • 9 F, 7 M • Mean age: 45 yr 9 participants from City B <ul style="list-style-type: none"> • 6 F, 3 M • Mean age: 53 yr 10 participants from City C <ul style="list-style-type: none"> • 6 F, 4 M • Mean age: 45 yr 11 participants from City D <ul style="list-style-type: none"> • 8 F, 3 M • Mean age: 61 yr 	Qualitative study with focus groups	<p>Psychological responses</p> Blaming authorities, sense of isolation, helplessness, stigmatisation

CI: confidence interval; COPE: Coping Orientation to Problems Experienced; DSM: Diagnostic and Statistical Manual of Mental Disorders; ER: emergency room; F: female; ICU: intensive care unit; ID: infectious disease; M: male; OR: odds ratio; SARS: severe acute respiratory syndrome

Supplementary Table II. Quality appraisal of quantitative studies and mixed methods studies.

Study	Purpose	Literature review	Research design	Sample size, description	Valid, reliable outcome measures	Data analysis	Results, statistical significance	Dropouts/exclusions	Clinical importance	Conclusion	Limitations	Score out of 12
Cheng & Cheung (2005)	√	√	√	√	√	√	√	√	√	√	√	12
Cheng et al (2004b)	√	√	√	√	√	√	√	√	√	√	√	12
Cheng et al (2006a)	√	√	√	√	√	√	√	√	√	√	√	12
Cheng et al (2006b)	√	√	√	√	√	√	√	√	√	√	√	12
Lee et al (2005)	√	√	√	√	√	√	√	√	√	√	√	12
Leung et al (2003)	√	√	√	√	√	√	√	√	√	√	√	12
Main et al (2011)	√	√	√	√	√	√	√	-	√	√	√	11
Mak et al (2009)	√	√	√	√	√	√	√	-	√	√	√	11
Peng et al (2010)	√	√	√	√	√	√	√	√	√	√	√	12
Puterman et al (2009)	√	√	√	√	√	√	√	-	√	√	√	11
Qian et al (2005)	√	√	√	√	-	√	√	-	√	√	√	10
Sim et al (2010)	√	√	√	√	√	√	√	√	√	√	√	12
Taha et al (2014)	√	√	√	√	√	√	√	-	√	√	√	11
Yeung & Fung (2007)	√	√	√	√	√	√	√	√	√	√	√	12

Supplementary Table III. Quality appraisal of qualitative studies and mixed methods studies.

Study	Purpose	Rationale	Conceptual framework	Ethical considerations	Sampling strategy	Data collection	Data management procedure	Data analysis method	Threat to reliability, validity	Conclusion	Score out of 10
Chan et al (2007)	√	√	√	√	√	√	√	√	√	√	10
Cheng et al (2006a)	√	√	√	√	√	√	-	√	√	√	9
Chiang et al (2007)	√	√	√	√	√	√	√	√	-	√	9
Dodgson et al (2010)	√	√	√	√	√	√	√	√	√	√	10
Joffe & Haarhoff (2002)	√	√	√	-	√	√	√	√	√	√	9
Lee et al (2005)	√	√	√	√	√	√	√	-	√	√	9
Matua & Van Der Wal (2015)	√	√	√	√	√	√	√	√	√	√	10
McCauley et al (2013)	√	√	√	√	√	√	√	√	√	√	10
Mok et al (2005)	√	√	√	√	√	√	√	√	√	√	10
Rabelo et al (2016)	√	√	√	√	√	√	√	√	√	√	10
Schwerdtle et al (2017)	√	√	√	√	√	√	√	√	√	√	10
Siu et al (2007)	√	√	√	√	√	√	√	√	√	√	10