

COVID-19 Community Protection: Some Science for Non-Scientists

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First published 1st May 2020. This version 09:00 BST 8th June 2020
[BUT UNDER CONSTANT EXTENSION AND CORRECTION, SO CHECK AGAIN SOON]

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The more a community understands about the science of COVID-19, the better it will be able to manage its PPMs - personal protective measures - for itself. Here, in everyday English for community volunteer groups, are some of the technical findings.

INSTRUCTIONS FOR USE

Follow the **RED HIGHLIGHTS** in this column.
Everything else is background information.
NOTE THE MANY UNANSWERED QUESTIONS!!

THE TECHNICAL BITS		WHAT EACH STUDY TELLS US, AND WHY IT MATTERS
PUBLICATION DATE AUTHOR(S)	TITLE (CLICK TO READ THE ORIGINALS)	
1899 Flügge, C.	Die Verbreitung der Phthise durch staubförmiges Sputum und durch beim Husten verspritzte Tröpfchen. Translation: The spread of TB through dustified phlegm and through cough-sprayed droplets	THIS IS THE EARLIEST STUDY TO QUANTIFY THE SPREADING OF AN INFECTIOUS DISEASE BY RESPIRATORY DROPLETS FROM AN INFECTED PERSON'S COUGHING.
1934 Wells, W. F.	On airborne infection. II. Droplets and droplet nuclei Vocab: "Droplet nuclei" - the remains of a wet droplet of mucous saliva after the water has evaporated. Dried mucus, germs, salts, salivary peptides, etc. First page clickable - remainder behind paywall if required.	THIS IS THE PAPER WHICH INTRODUCED THE CONCEPT OF THE "DROPLET NUCLEUS" A VERY FINE AND DRY DERIVATIVE OF RESPIRATORY SPRAY WHICH STAYS AIRBORNE LONGER THAN THE LARGER DROPLETS, WHICH SIMPLY FALL TO EARTH. THERE IS A LOT MORE TO COME ABOUT DROPLETS AND DROPLET NUCLEI AS POSSIBLY UNDERESTIMATED VECTORS OF COVID-10 TRANSMISSION.
1946 [September] Duguid, J.	The size and the duration of air-carriage of respiratory droplets and droplet nuclei	THIS IS ANOTHER EARLY STUDY OF THE DROPLETS WHICH COME OUT OF US WHEN WE SNEEZE, COUGH, AND SPEAK . IT INCLUDES DROPLET SIZES, NUMBERS, DISTANCES TRAVELLED, AND ESTIMATED NUMBERS OF GERMS PER DROPLET. DROPLET NUCLEI TEND TO BE ABOUT A QUARTER THE SIZE OF DROPLETS, AND CAN REMAIN AIRBORNE FOR UP TO 90 MINUTES.
1961 [September] Riley, R. L.	Airborne pulmonary tuberculosis	THIS EARLY PAPER BY RICHARD L. RILEY ^(OBT) IS THE FIRST IN A 40-YEAR CAREER IN PUBLIC HEALTH RESEARCH AT JOHNS HOPKINS UNIVERSITY. WE MENTION IT HERE OUT OF RESPECT. RILEY WAS A STUDENT OF WELLS (ABOVE, 1934). MUCH OF THIS

		EARLY RESEARCH WAS DIRECTED AT THE PROBLEMS OF FIGHTING TUBERCULOSIS.
1965 [5th June] Tyrrell, D. A. J. and Bynoe, M. I.	Cultivation of a novel type of common-cold virus in organ culture	THIS IS THE PAPER WHICH FIRST ISOLATED AND DESCRIBED "A VIRUS VIRTUALLY UNRELATED TO ANY OTHER KNOWN VIRUS OF THE HUMAN RESPIRATORY TRACT". KNOWN AT THE TIME AS "SAMPLE B814", IT WILL BE NAMED A "CORONAVIRUS" IN 1968 BECAUSE ITS SPIKE PROTEINS ARE REMINISCENT OF THE SUN'S CORONA - ITS RING OF FLARES. (CORONA IS LATIN FOR "CROWN").
1967 Almeida, J. D. and Tyrrell, D. A. J.	The Morphology of Three Previously Uncharacterized Human Respiratory Viruses That Grow in Organ Culture	AFTER FURTHER EXPERIMENTS WITH "SAMPLE B814" THESE AUTHORS REPORTED THAT UNDER ELECTRON MICROSCOPY THAT PARTICULAR VIRUS WAS "MORPHOLOGICALLY IDENTICAL WITH AVIAN INFECTIOUS BRONCHITIS".
1968 De Jong, J. C. and Winkler, K. C.	The inactivation of poliovirus in aerosols	THIS DELIGHTFULLY DIRECT LABORATORY STUDY OBSERVED HOW QUICKLY POLIOVIRUS WAS INACTIVATED IN AEROSOL DROPLETS AS A RESULT OF ENVIRONMENTAL FACTORS. THEY FOUND THAT LOW AIR HUMIDITY SPEEDED VIRAL BREAKDOWN, BUT OXYGEN LEVELS DID NOT.
1991 [October] Ansari, S. A., et al.	Potential role of hands in the spread of respiratory viral infections	THIS PAPER EXPLORES HOW VIRUSES ARE TRANSMITTED BY TOUCH. THINGS ARE A LOT MORE COMPLICATED THAN YOU MIGHT THINK, BUT THE ADVICE, IN SHORT, IS TO KEEP YOUR HANDS WASHED!
1996 [1st March] Glezen W. P.	Emerging infections: Pandemic influenza	THIS IS A HIGHLY TECHNICAL PAPER, BUT IT CONTAINED A CLEAR EARLY WARNING OF AVIAN VIRUSES MUTATING TO BECOME A THREAT TO HUMANS.
1998 [August] Cole, E. C. and Cook, C. E.	Characterisation of infectious aerosols in health care facilities	THIS PAPER ARGUES THAT FOR EFFECTIVE HOSPITAL INFECTION CONTROL YOU NEED AN "ENVIRONMENTAL MANAGEMENT FRAMEWORK" OF MANY PREVENTIVE STRATEGIES, INCL. CLEANING. COMMUNITY VOLUNTEERS NEED TO DECIDE WHAT SUBSET OF THOSE STRATEGIES ALSO APPLIES OUT IN THE COMMUNITY. THIS IS IMPORTANT BECAUSE THERE WILL BE NO MANAGEMENT FRAMEWORK OUT IN THE COMMUNITY TO LOOK AFTER YOU!
1999 [July] Cole, A. M., et al.	Innate antimicrobial activity of nasal secretions	THIS PAPER REPORTS ON THE ROLE OF IMMUNOGLOBULIN AND OTHER (POLY)PEPTIDES IN NASAL SECRETIONS AS AIRWAY PROTECTION.
2001 [March] Goldmann, D. A.	Epidemiology and prevention of pediatric viral respiratory infections in health care institutions	THIS PAPER REVIEWS THE THREE MAIN TYPES OF VIRAL RESPIRATORY INFECTION, INSOFAR AS THEY AFFECT CHILDREN. IT JUDGES THAT RSV (CROUP) IS MAINLY CONTACT TRANSMITTED, THAT INFLUENZA IS DEMONSTRABLY AIRBORNE, AND THAT THE RHINOVIRUS (COMMON COLD) IS BOTH.
2002 [16th November]	SARS PATIENT ZERO TRACED BACK TO THIS DATE	
2003 [6th January] Haikkinen, T. and Jarvinen, A.	The common cold	THIS PAPER INCLUDES A USEFUL LIST OF THE DIFFERENT VIRUS TYPES WITHIN THE CATEGORY OF COMMON COLD (CORONAVIRUS HAVING BEEN RECOGNISED BY NOW AS THE SECOND MOST COMMON CAUSE THEREOF).
2004 [8th January] Centres for Disease Control and Prevention (CDC)	Community containment measures, including non-hospital isolation and quarantine AMERICAN RECOMMENDATIONS	THIS AMERICAN DOCUMENT SETS OUT RECOMMENDATIONS FOR COMMUNITY PPMs IN THE WAKE OF THE 2003 SARS PANDEMIC. INTERESTINGLY, THE CDC INCLUDES "PASSIVE MONITORING" AS A VALUABLE COMMUNITY FUNCTION, PERHAPS BY ENCOURAGING HOUSEHOLD CONTACTS TO TAKE AND RECORD TEMPERATURE. THEY EVEN SUGGEST MAINTAINING A RECORD SHEET. WHEN IT COMES TO "ACTIVE MONITORING". COMMUNITY VOLUNTEERS TO CONSIDER WHETHER/HOW TO ASSIST PASSIVE MONITORING.
2004 [22nd April]	Evidence of airborne transmission of the [SARS] virus	THIS TEAM LOOKED AT AIRFLOW IN AN INFECTED RESIDENTIAL DEVELOPMENT IN HONG KONG FOLLOWING ONE OF ITS

<p>Yu, I., et al.</p>	<p>Vocab: "Index case" - the first person in a localised grouping suspected of having an infection (as opposed to "Patient Zero", the first person in an entire epidemic).</p>	<p>RESIDENTS BEING DIAGNOSED WITH SARS. THERE WERE THEN 186 LATER CASES, MANY LIVING ABOVE THE INDEX CASE. "THIS FINDING IS CONSISTENT WITH A RISING PLUME OF CONTAMINATED WARM AIR." COMMUNITY VOLUNTEERS TO NOTE.</p>
<p>2004 [14th December] Edwards, D. A.</p>	<p>Inhaling to mitigate exhaled bioaerosols</p>	<p>THIS PAPER REPORTS THAT USE OF A NEBULISER WITH ISOTONIC SALINE CAN REDUCE A PERSON'S RESPIRATORY SPRAY BY AROUND 75% FOR UP TO SIX HOURS. COMMUNITY VOLUNTEERS TO NOTE.</p>
<p>2005 [31st May] Rabenau, H.F., et al.</p>	<p>Efficacy of various disinfectants against SARS coronavirus</p>	<p>THE THRUST OF THIS PAPER IS THAT THERE IS NOT MUCH TO CHOOSE BETWEEN THE MAIN DISINFECTING AGENTS. ALL ARE PRETTY GOOD. COMMUNITY VOLUNTEERS TO NOTE.</p>
<p>2005 [October] Cetron, M. and Landwirth, J.</p>	<p>Public health and ethical considerations in planning for quarantine</p>	<p>THIS PAPER INCLUDES A LONG HISTORICAL INTRODUCTION TO QUARANTINE PROCEDURES, AND THEN MOVES ON TO PANDEMIC PREPAREDNESS PLANNING. IT CONCLUDES THAT ALL TOP-DOWN PUBLIC HEALTH MEASURES REQUIRE PUBLIC COOPERATION AND TRUST, OR RISK BEING IGNORED. COMMUNITY VOLUNTEERS TO NOTE.</p>
<p>2006 [28th July] Masters, P. S.</p>	<p>The molecular biology of coronaviruses</p>	<p>THIS IS AN EXCELLENT INTRODUCTION TO HOW CORONAVIRUSES ARE CONSTRUCTED CHEMICALLY. IT GETS A BIT TECHNICAL FROM SECTION F ONWARDS, BUT THERE IS MUCH TO LEARN BEFORE THAT. FIGURE 1 SHOWS YOU YOUR ENEMY IN DETAIL, AND IS WORTH A QUICK LOOK.</p>
<p>2006 [17th August] Tang, J. W., et al.</p>	<p>Factors involved in the aerosol transmission of infection and control of ventilation in healthcare premises</p>	<p>THIS IS A HIGHLY INFORMATIVE AND DETAILED OVERVIEW OF THE DIFFERENT TYPES OF SPRAY WE EMIT, HOW FAR THEY TRAVEL, AND HOW TO PPE/PPM AGAINST THEM. ***** IF YOU ONLY HAVE TIME TO READ ONE STUDY, MAKE IT THIS ONE!! *****</p>
<p>2006 [7th November] Wilson-Clark, S. D., et al.</p>	<p>Household transmission of SARS</p>	<p>THIS PAPER ANALYSED THE SPREAD OF SARS IN CANADIAN HOUSEHOLDS IN 2003, AND CONCLUDED THAT "THE PRIMARY RISK FACTORS FOR TRANSMISSION FELL INTO 3 AREAS: THE DURATION OF TIME SPENT IN THE HOME AFTER THE INDEX CASE BECAME ILL, POOR HAND HYGIENE PRACTICES AND POOR USE OF RESPIRATORY PROTECTIVE MEASURES".</p>
<p>2007 [April] Weiss, M. M., et al.</p>	<p>Disrupting the transmission of influenza A: Face masks and ultraviolet light as control measures</p>	<p>THIS STUDY POINTS OUT THAT "IN THE EVENT OF AN INFLUENZA PANDEMIC, WHERE EFFECTIVE VACCINE AND ANTIVIRAL DRUGS MAY BE LACKING, DISRUPTING ENVIRONMENTAL TRANSMISSION OF THE INFLUENZA VIRUS WILL BE THE ONLY VIABLE STRATEGY TO PROTECT THE PUBLIC". TO HELP ACHIEVE THIS, IT THEN RECOMMENDS FACE MASKS AND ULTRAVIOLET (UV) LIGHT, BOTH PRESENTLY "LARGELY OVERLOOKED" AND "UNDERAPPRECIATED". IT THEN RECOMMENDS THAT "REUSABLE MASKS SHOULD BE STOCKPILED, BECAUSE THE SUPPLY OF DISPOSABLE MASKS WILL LIKELY PROVE INADEQUATE".</p>
<p>2007 [29th May] Xie, X., et al.</p>	<p>How far droplets can move in indoor environments</p>	<p>THIS PAPER DEMONSTRATES THAT TALKING FOR 5 MINS PRODUCES THE SAME AMOUNT OF RESPIRATORY SPRAY AS A SINGLE COUGH. IT INCLUDES AN INTERESTING DETAILED HISTORY OF AEROSOL PHYSICS. LARGE DROPLETS CAN TRAVEL 6M WHEN SNEEZING, 2M WHEN COUGHING, AND 1M WHEN JUST BREATHING. SMALLER DROPLETS STAY AIRBORNE LONGER SO WILL DRIFT FURTHER. THE QUESTION FOR COMMUNITY VOLUNTEERS IS THEREFORE WHERE TO STAND, AND WHAT PPMs ARE APPROPRIATE. BUT BEFORE DECIDING, READ THE NEXT ENTRY ...</p>
<p>2007 [1st August] Hall, C. B.</p>	<p>The spread of influenza and other respiratory viruses: Complexities and conjectures</p>	<p>THIS STUDY COMPARES LARGE AND SMALL RESPIRATORY DROPLETS AS DISEASE SPREADING VECTORS. IT REGARDS THE LARGE PARTICLE AEROSOLS AS CLOSE-RANGE RISK ONLY, ALTHOUGH THE SMALL DROPLET NUCLEI AEROSOLS ARE</p>

		<p>MORE LIKELY TO CAUSE A "RAPID, EXPLOSIVE OUTBREAK". TABLE 3 LISTS SEPARATE PPE/PPM FOR THE TWO TYPES OF AEROSOL, BUT THESE ARE FOR HOSPITAL APPLICATIONS, NOT CARE HOME OR COMMUNITY.</p> <p>COMMUNITY VOLUNTEERS SHOULD BE AWARE OF THE TABLE 3 OPTIONS.</p>
2007 [15th August] Aledort, J. E., et al.	<p>Non-pharmaceutical public health interventions for pandemic influenza: an evaluation of the evidence base</p> <p>AMERICAN RECOMMENDATIONS</p> <p>Vocab: "Non-Pharmaceutical Interventions (NPIs)" - healthcare or Personal Protection Measures (PPMs) not requiring medicines or medical treatment (e.g. hand-washing)</p>	<p>THIS STUDY LOOKS AT SUCH PPMs AS HAND HYGIENE, MASKS, ETC., GIVING DETAIL ON EACH IN TURN. IT THEN NOTES THAT COMMUNITY INVOLVEMENT IS IMPORTANT IN GETTING GOVERNMENT RECOMMENDATIONS ACTED UPON.</p> <p>TABLE 3 SHOWS YOU THE MAIN HEADINGS FOR NON-PHARMACEUTICAL INTERVENTION, AND IS WELL WORTH A QUICK LOOK.</p>
2007 [25th December] Yang, S. H., et al.	<p>The size and concentration of droplets generated by coughing in human subjects</p> <p>Abstract only seen - full article behind paywall if required.</p>	<p>THIS PAPER PRESENTS STATS ON THE SIZE AND LIFESPAN OF COUGHED DROPLETS, BY AGE AND GENDER. IT ALSO INCLUDES THE OBSERVATION THAT "DROPLET NUCLEI CONCENTRATIONS FROM MALE SUBJECTS WERE CONSIDERABLY HIGHER THAN THAT FROM FEMALES".</p>
2008 [16th February] Atkinson, M. P. and Wein, M.	<p>Quantifying the routes of transmission for pandemic influenza</p> <p>Abstract only seen - full article behind paywall if required.</p>	<p>THIS PAPER REPORTS THAT "AEROSOL TRANSMISSION IS FAR MORE DOMINANT THAN CONTACT TRANSMISSION FOR INFLUENZA".</p> <p>COMMUNITY VOLUNTEERS TO NOTE.</p>
2008 [25th April] Schauber, J. and Gallo, R.	<p>Antimicrobial peptides and the skin immune defence system</p>	<p>THIS STUDY DISCUSSES THE ROLE OF PROTEIN-PRECURSOR CHEMICALS KNOWN AS PEPTIDES IN CREATING A NATURAL ANTIMICROBIAL ACTION IN SALIVA. IT THEN MENTIONS A POSSIBLE ROLE FOR VITAMIN D3 IN MAINTAINING THIS PROTECTIVE BARRIER.</p>
2008 [9th July] van der Sande, M., et al.	<p>Professional and home-made masks reduce exposure to respiratory infections among the general population</p>	<p>THIS VERY THOROUGH STUDY SPECIFICALLY ASSESSES THE ROLE OF MASKS IN THE COMMUNITY, BOTH FOR "INWARD" AND "OUTWARD" PROTECTION. IT FINDS A SIGNIFICANT AMOUNT OF PROTECTION EVEN FROM HOME-MADE MASKS SUCH AS TEA TOWELS.</p> <p>COMMUNITY VOLUNTEERS TO NOTE. TABLE 1 OFFERS A NEAT SUMMARY.</p>
2008 [November] Weber, T. P. and Stilianakis, N. I.	<p>Inactivation of influenza A virus in the environment and modes of transmission: A critical review</p>	<p>THIS VERY THOROUGH STUDY COMPARED AIRBORNE AND CONTACT TRANSMISSION OF THE INFLUENZA A VIRUS, CONCLUDING THAT BOTH ROUTES ARE INVOLVED. HERE IS A TYPICAL OBSERVATION: "AT LOW [RELATIVE HUMIDITY] AND LOW TO MODERATELY HIGH TEMPERATURE (UP TO 25 °C) AND IF NOT EXPOSED TO UV RADIATION AND POLLUTANTS, INFLUENZA A VIRUSES MAY REMAIN ALIVE AND INFECTIOUS FOR A CONSIDERABLE TIME IN THE AIRBORNE STATE". THE AUTHORS ESTIMATE THAT A RESPIRATORY DROPLET MIGHT CONTAIN BETWEEN A THOUSAND AND TEN MILLION VIRUSES, WITH A HALF LIFE OF BETWEEN ONE AND 16 HOURS.</p>
2009 [15th April]	H1N1 PATIENT ZERO TRACED BACK TO THIS DATE	
2009 [22nd July] Stelzer-Braid, S., et al.	<p>Exhalation of respiratory viruses by breathing</p> <p>Abstract only seen - full article behind paywall if required</p>	<p>"OF THE 25 SUBJECTS WHO HAD VIRUS-POSITIVE NASAL MUCUS, THE SAME VIRUS TYPE WAS DETECTED IN 12 BREATHING SAMPLES, 8 TALKING SAMPLES, AND IN 2 COUGHING SAMPLES."</p> <p>THE QUESTIONS FOR COMMUNITY VOLUNTEERS ARE (1) WHAT SORT OF PPMs TO ADOPT WHEN JUST TALKING TO SOMEONE, AND (2) WHEN IS IT SAFE TO STAND DOWN THOSE PROTECTIONS AFTER A CONTACT.</p>
2009 [September] Johnson, G. R. and Morawska, L.	<p>The mechanism of breath aerosol formation</p> <p>Abstract only seen - full article behind paywall if required</p>	<p>THIS PAPER LOOKED AT THE BIOMECHANICS OF DROPLET FORMATION AND CONCLUDED THAT "THE RESULTS WERE CONSISTENT WITH THE BREATH AEROSOL BEING PRODUCED THROUGH FLUID FILM RUPTURE IN THE RESPIRATORY BRONCHIOLES IN THE EARLY STAGES OF INHALATION AND THE</p>

		RESULTING AEROSOL BEING DRAWN INTO THE ALVEOLI AND HELD BEFORE EXHALATION."
2009 [21st September] Jefferson, T., et al.	Physical interventions to interrupt or reduce the spread of respiratory viruses Vocab: "Non-Pharmaceutical Interventions (NPIs)" - healthcare or Personal Protection Measures (PPMs) not requiring medicines or medical treatment (e.g. hand-washing)	THIS IS A 67-PAPER VERY DETAILED REVIEW OF THE ROLE PLAYED BY NON-PHARMACEUTICAL INTERVENTIONS AT ALL LEVELS OF HEALTHCARE. AS SUCH, IT CONFIRMS THE CONCLUSIONS ALREADY HIGHLIGHTED ABOVE. INTERESTINGLY IT SPECIFICALLY NOTES THE NEED FOR PARTIAL PROTECTIONS IN HOSPITALISED CASES OF "SUSPICION DIAGNOSIS WITH ISOLATION". COMMUNITY VOLUNTEERS CONTACTING SUSPECTED HOUSEHOLDS TO NOTE.
2009 [8th October] Tang, J. W., et al.	A schlieren optical study of the human cough with and without wearing masks	THIS PAPER SHOWS FREEZE FRAME PHOTOGRAPHS OF RESPIRATORY SPRAY WHEN COUGHING (1) WITHOUT A MASK, (2) WITH A SURGICAL MASK, AND (3) WITH A HIGHER SPECIFICATION N95 MASK. COMMUNITY VOLUNTEERS SHOULD EXAMINE THESE PHOTOGRAPHS BEFORE CHOOSING A PARTICULAR LEVEL OF PROTECTION.
2009 [6th December] Tellier, R.	Aerosol transmission of influenza A virus	THIS IS ANOTHER STUDY TO POINT TO "THE AEROSOL ROUTE IN THE TRANSMISSION OF INFLUENZA". IT WARNS FURTHERMORE THAT "IT MAY WELL BE THAT AEROSOL TRANSMISSION IS RESPONSIBLE FOR THE MOST SEVERE CASES OF DISEASE". FOR CLOSE CONTACT, "PRECAUTIONS SHOULD INCLUDE THE USE OF AN N95 RESPIRATOR (OR BETTER)". COMMUNITY VOLUNTEERS TO NOTE.
2010 [22nd January] Cowling, B. J., et al.	Face masks to prevent transmission of influenza virus: A systematic review	THIS PAPER REVIEWS THE SUCCESS OF MASK WEARING DURING THE 2009 INFLUENZA A (H1N1) PANDEMIC. IT CONCLUDES THAT "THERE IS SOME EVIDENCE TO SUPPORT THE WEARING OF MASKS OR RESPIRATORS DURING ILLNESS TO PROTECT OTHERS, AND PUBLIC HEALTH EMPHASIS ON MASK WEARING DURING ILLNESS MAY HELP TO REDUCE INFLUENZA VIRUS TRANSMISSION. THERE ARE FEWER DATA TO SUPPORT THE USE OF MASKS OR RESPIRATORS TO PREVENT BECOMING INFECTED." COMMUNITY VOLUNTEERS TO NOTE.
2010 [15th February] Aiello, A. E., et al.	Mask use, hand hygiene, and seasonal influenza-like illness among young adults	THIS STUDY SUGGESTS THAT FACE MASKS AND HAND HYGIENE MAY REDUCE RESPIRATORY ILLNESSES IN SHARED LIVING SETTINGS AND MITIGATE THE IMPACT OF INFLUENZA A (H1N1).
2010 [May] Aiello, A. E., et al.	Research findings from nonpharmaceutical intervention studies AMERICAN RECOMMENDATIONS AGAINST THE 2009 H1N1 PANDEMIC	THIS IS AN IMPORTANT PAPER IN THE PRESENT CONTEXT BECAUSE IT ADDRESSES HOW TO DELIVER EFFECTIVE "COMMUNITY MITIGATION" IN SLOWING OR LIMITING THE TRANSMISSION OF A PANDEMIC VIRUS. IT IDENTIFIES MANY AREAS OF NEED OVER AND ABOVE THE SIMPLE EXPEDIENTS OF "COUGH ETIQUETE", HAND WASHING, SOCIAL DISTANCING, AND MASK WEARING. PERHAPS THE MOST CHALLENGING OF THESE ADDITIONAL NEEDS IS COMMUNITY EDUCATION. INDEED THE AUTHORS CALL FOR FUTURE RESEARCH TO "INCLUDE ASSESSMENTS OF PSYCHOSOCIAL AND CULTURAL FACTORS THAT SHAPE COMPLIANCE WITH NPIS, TO EXPLORE WHY CERTAIN GROUPS ACCEPT NPIS WHILE OTHERS DO NOT" . COMMUNITY VOLUNTEERS TO NOTE THE NEED FOR BETTER UNDERSTANDING OF WHO DISOBEYS NPI RULES, AND WHY. ALSO TO PASS ON ITEMS OF GOOD PRACTICE AS THEY COME TO LIGHT.
2010 [30th August] Wei, J.	Airborne spread of infectious agents in the indoor environment	***** NOTE THIS VERY WELL ***** THIS STUDY LOOKED AT THE TRANSMISSION OF INFECTIOUS AGENTS FROM AN INDEX CASE'S MUCOUS MEMBRANES TO THE MUCOUS MEMBRANES OF PEOPLE SHARING THE SAME ROOM. IT INCLUDES A THOROUGH EXPLANATION OF HOW BIOAEROSOLS ARE PRODUCED, WITH FOUR HELPFUL DIAGRAMS. IT NOTED THAT LARGE DROPLETS FALLING UNDER GRAVITY COULD INFECT LOWER BODY CLOTHING WHILE FINER DROPLETS OR DROPLET NUCLEI COULD BE BREATHED IN FURTHER AWAY. THE CONTAMINATED CLOTHING COULD THEN THROW OFF DRY PARTICLES DURING WALKING.

		<p style="text-align: center;">***** NOTE THIS VERY WELL *****</p> <p>COMMUNITY VOLUNTEERS MAY FIND IT USEFUL TO PRINT OUT THE FOUR DIAGRAMS MENTIONED ABOVE AS REFERENCE MATERIAL. THEN, IN THE LIGHT OF FIGURE 4 IN PARTICULAR, ADJUST THEIR CONTACT DISTANCING ACCORDINGLY. ALSO, IF OUTDOORS, NOT TO STAND DIRECTLY DOWNWIND OR UPWIND OF THEIR CONTACT.</p>
2011 [14th January] Troko, J., et al.	Is public transport a risk factor for acute respiratory infection?	THIS STUDY REPORTED THAT "RECENT BUS OR TRAM USE WITHIN FIVE DAYS OF SYMPTOM ONSET WAS ASSOCIATED WITH AN ALMOST SIX-FOLD INCREASED RISK OF CONSULTING FOR [ACUTE RESPIRATORY INFECTION]." THE STUDY WAS CARRIED OUT IN NOTTINGHAM 2008-2009.
2011 [June] Fabian, P., et al.	Origin of exhaled breath particles from healthy and human rhinovirus-infected subjects	THIS STUDY PRESENTS LOTS OF AEROSOL PARTICLE COUNTS OBTAINED WITH DIFFERENT TYPES OF BREATHING. IT INCLUDES EXCELLENT DISCUSSION ON THE BIRTH OF DROPLETS IN THE AIRWAYS, BOTH LOW AND HIGH, IF INTERESTED. QUITE TECHNICAL.
2011 [6th July] Stein, R. A.	Super-spreaders in infectious diseases	THIS PAPER CONTAINS LOTS OF FASCINATING DETAIL ABOUT THE SPREAD OF SARS. THE MAIN POINT IS THAT 20% OF THOSE INFECTED DO MOST OF THE SPREADING. THE ARE THE SO-CALLED " SUPER-SPREADERS ". THE OTHER 80% "INFECT FEW, IF ANY, SECONDARY CONTACTS". COMMUNITY VOLUNTEERS TO NOTE, AND PERHAP ERR ON THE SIDE OF CAUTION.
2011 [21st December] Bin-Raza, F., et al.	The use of masks and respirators to prevent transmission of influenza: A systematic review	THIS PAPER NOTES A LOT OF CONFLICTING EVIDENCE BUT IS NEVERTHELESS ABLE TO CONCLUDE THAT "THE EFFECTIVENESS OF MASKS AND RESPIRATORS IS LIKELY LINKED TO EARLY, CONSISTENT, AND CORRECT USAGE". COMMUNITY VOLUNTEERS TO NOTE, AND PASS ON TO CONTACTS IF NECESSARY.
2012 [29th March] Noti, J. D., et al.	Detection of infectious influenza virus in cough aerosols generated in a simulated patient examination room	THIS PAPER IS PARTICULARLY USEFUL BECAUSE IT COMPARED MASK EFFICIENCY UNDER LABORATORY CONDITIONS. IT PROVIDES LOTS OF DETAILED FIGURES AND DATA TABLES AND CONCLUDES THAT ALL MASKS ARE USEFUL, THAT TIGHTLY FITTED N95s ARE BEST, BUT STILL ONLY 95% EFFECTIVE. COMMUNITY VOLUNTEERS TO NOTE (AND CONSULT FIGURES AND TABLES IF INTERESTED).
2012 [30th August] Mohr, O., et al.	Evidence for airborne infectious disease transmission in public ground transport - a literature review	THIS STUDY ASSESSES 32 PRIOR REPORTS OF INFECTIONS LINKED BY SHARING BUS OR TRAIN WITH AN AN INDEX CASE. MOST INDEX CASES HAD TB, A FEW MEASLES AND SARS. ENOUGH SECONDARY INFECTIONS WERE FOUND TO CAUSE CONCERN. MOST JOURNEYS WERE LONG DISTANCE, AND SO THE EXPOSURE WAS OF SEVERAL HOURS.
2012 [27th September]	MERS PATIENT ZERO TRACED BACK TO THIS DATE	
2013 [7th March] Milton, D. K., et al.	Influenza virus aerosols in human exhaled breath: Particle size, culturability, and effect of surgical masks CDC-FUNDED STUDY	THIS PAPER REPORTS FINDING INFECTIOUS VIRUS IN FINE PARTICLE AEROSOLS AND RECOMMENDS SURGICAL MASKS BE WORN BY INFECTED PERSONS. COMMUNITY VOLUNTEERS TO NOTE, AND PERHAPS INCREASE THEIR SOCIAL DISTANCING WHEN DEALING WITH UNMASKED CONTACTS.
2013 [20th August] Cocoros, N. M., et al.	Obesity as a risk factor for severe influenza-like illness	THIS STUDY FINDS EVIDENCE THAT PATIENT OBESITY IS A "SMALL TO MODERATE" RISK FACTOR FOR H1N1 INFLUENZA. COMMUNITY VOLUNTEERS MAY CARE TO CONSIDER POLITELY STEERING THEIR LARGER MEMBERS TOWARD NON-CONTACT ADMINISTRATIVE DUTIES :-)
2013 [10th October] Lednický, J. A. and Loeb, J. C.	Detection and isolation of airborne influenza A H3N2 virus using a Sioutas Personal Cascade Impactor Sampler (PCIS) Vocab: " Cascade Filtering " - the use of progressively finer filters to	PCIS SAMPLING DETECTED ULTRAFINE DROPLETS CONTAINING LIVE VIRUS UP TO 3.7M AWAY FROM SICK PERSONS. THIS STUDY WAS NOT DONE WITH A CORONAVIRUS, BUT IT IS OF CONCERN NONETHELESS BECAUSE A DROPLET IS GOING TO BEHAVE LIKE A DROPLET REGARDLESS OF WHICH VIRUS IS ABOARD.

	sort large particles from small. "PCIS" - kit to carry out same.	***** COMMUNITY VOLUNTEERS TO NOTE VERY CAREFULLY *****
2014 [April] World Health Organisation	Infection prevention and control of epidemic and pandemic-prone acute respiratory infections in healthcare W.H.O. RECOMMENDATIONS	THIS IS A VERY COMPREHENSIVE DOCUMENT AND ALL COMMUNITY VOLUNTEERS SHOULD CHECK OUT THE SORT OF ADVICE IT HAS TO OFFER. WE DRAW PARTICULAR ATTENTION TO THE SECTION ENTITLED " HIGH-RISK AEROSOL GENERATING PROCEDURES ", FOR THE ADVICE IT CONTAINS ON THE PROPER FITTING OF MASKS AND RESPIRATORS.
2014 [August] McBride, R., et al.	The coronavirus nucleocapsid is a multifunctional protein Vocab: " Nucleocapsid " - the N protein in the core of an enveloped virus like coronavirus. See the Masters paper at 28th July 2006 above, and see the Figure 1 therein	THIS HIGHLY TECHNICAL PAPER CONCLUDES WITH THE HOPE THAT UNDERSTANDING THE ROLE OF NUCLEOCAPSID, OR "N", PROTEINS IN CORONAVIRUS INFECTION "COULD LEAD TO THE DEVELOPMENT OF NOVEL THERAPEUTICS THAT COULD POTENTIALLY BE USED TO COMBAT THE THREAT POSED BY THE EMERGING LETHAL HUMAN CORONAVIRUSES IDENTIFIED IN RECENT TIMES".
2015 [1st February] Kwok, Y. L., et al.	Face touching: S frequent habit that has implications for hand hygiene	THIS STUDY VIDEO'D 26 MEDICAL STUDENTS AND FOUND THAT EACH TOUCHED THEIR FACE ON AVERAGE 23 TIMES PER HOUR, 44% OF THOSE TOUCHES INVOLVED A MUCOUS MEMBRANE (OF THOSE 36% MOUTH, 31% NOSE, 27% EYES, 6% COMBO). FIG. 1 SHOWS THE EAR, EYE, HAIRLINE, ETC. NOT SURPRISING, BUT DIFFICULT TO PREVENT. COMMUNITY VOLUNTEERS TO NOTE.
2015 [1st March] Rashid, H., et al.	Evidence compendium and advice on social distancing and other related measures for response to an influenza pandemic Abstract only seen - full article behind paywall if required	THIS PAPER REVIEWS A NUMBER OF EARLIER REPORTS INTO THE ROLE OF SCHOOL OR WORK-PLACE INTERVENTIONS, DISTANCING AND QUARANTINE, LOCKDOWN, AND BANNING OF MASS GATHERINGS. SCHOOL CLOSURE IS "MODERATELY EFFECTIVE". HOME ISOLATION IS EFFECTIVE, BUT RISKS INTRA-HOUSEHOLD TRANSMISSION. HOME WORKING IS "MODESTLY" EFFECTIVE. LOCKDOWN IS ONLY EFFECTIVE IF MORE THAN 50% OF JOURNEYS ARE PREVENTED. MASS GATHERINGS BEFORE THE EPIDEMIC PEAK ARE UNSAFE.
2015 [May] Jones, R. M. and Brosseau, L. M.	Aerosol transmission of infectious disease Abstract only seen - full article behind paywall if required	THIS PAPER CONCLUDES THAT "THE PATHOGEN REMAINS VIABLE IN THE ENVIRONMENT FOR SOME PERIOD OF TIME".
2016 [15th April] Lindsley, W. G., et al.	Viable influenza A virus in airborne particles expelled during coughs versus exhalations	THIS STUDY REPORTS THAT "FIFTY-THREE TEST SUBJECTS TESTED POSITIVE FOR INFLUENZA A VIRUS. OF THESE, 28 (53%) PRODUCED AEROSOL PARTICLES CONTAINING VIABLE INFLUENZA A VIRUS DURING COUGHING, AND 22 (42%) PRODUCED AEROSOLS WITH VIABLE VIRUS DURING EXHALATION. " COMMUNITY VOLUNTEERS TO NOTE.
2016 [11th June] Liu, L., et al.	Short-range airborne transmission of expiratory droplets between two people Abstract only seen - full article behind paywall if required	THIS PAPER WARNS THAT THERE IS A SERIOUS RISK OF LARGE DROPLET INHALATION OR SKIN DEPOSIT WITHIN 1.5M IN EVERYDAY CONVERSATION. COMMUNITY VOLUNTEERS TO NOTE.
2016 [1st August] Kim, S. H., et al.	Extensive viable Middle East Respiratory Syndrome (MERS) coronavirus contamination in air and surrounding environment in MERS isolation wards	THESE RESEARCHERS TOOK SWABS FROM MULTIPLE POINTS IN TWO HOSPITALS, AND FOUND THAT DESPITE HIGH END ANTI-INFECTION PROCEDURES THERE WERE LIVE CORONAVIRUS BUGS JUST ABOUT EVERYWHERE. THIS IS TOTALLY CONSISTENT WITH THE COPIOUS LITERATURE ON AIRBORNE SPREAD LISTED ABOVE.
2016 [September] Leitmeyer, K. and Adlhoch, C.	Influenza transmission on aircraft: A systematic literature review	THIS STUDY REPORTS THAT AS A RULE OF THUMB YOU ARE AT RISK OF CROSS-INFECTION IN AN AIRLINER IF SAT WITHIN TWO ROWS OF AN INDEX CASE. COMMUNITY VOLUNTEERS TO KEEP AN EYE OPEN FOR CONTACT HOUSEHOLDS WITH MEMBERS JUST FLOWN HOME FROM ABROAD.

<p>2018 [18th January]</p> <p>Yan, J., et al.</p>	<p>Infectious virus in exhaled breath of symptomatic seasonal influenza cases from a college community</p>	<p>THIS WELL DESIGNED AND CONTROLLED STUDY PROVIDES "OVERWHELMING EVIDENCE THAT HUMANS GENERATE INFECTIOUS AEROSOLS" MERELY BY BREATHING. THEY DON'T EVEN HAVE TO COUGH OR SNEEZE IN YOUR DIRECTION.</p>
<p>2018 [1st September]</p> <p>Avery, J. C. and Hoffmann, P. R.</p>	<p>Selenium, selenoproteins, and immunity</p>	<p>THIS PAPER "PRESENTS A SUMMARY OF THE CURRENT UNDERSTANDING OF THE ROLE OF SELENIUM AND SELENOPROTEINS IN REGULATING IMMUNE CELL FUNCTIONS AND HOW DYSREGULATION OF THESE PROCESSES MAY LEAD TO INFLAMMATION OR IMMUNE-RELATED DISEASES." THIS CAN, OF COURSE, IMPACT BOTH ON CONTACTS THEMSELVES AND THEIR CARERS.</p> <p>THIS IS THE FIRST IN A STEADY STREAM OF REPORTS LINKING DIET TO A STRONG IMMUNE SYSTEM. COMMUNITY VOLUNTEERS TO NOTE THE RISKS AND ADJUST THEIR PPMs ACCORDING TO THEIR OWN JUDGEMENT.</p>
<p>2018 [17th October]</p> <p>Maggini, S., et al.</p>	<p>Immune function and micronutrient requirements change over the life course</p>	<p>THIS PAPER OPENS WITH THE OBSERVATION THAT "VARIOUS MICRONUTRIENTS ARE ESSENTIAL FOR IMMUNOCOMPETENCE, PARTICULARLY VITAMINS A, C, D, E, B2, B6, AND B12, FOLIC ACID, IRON, SELENIUM, AND ZINC." IT THEN TRACKS HOW THESE GRADUALLY BECOME LESS EFFECTIVE WITH OLD AGE.</p> <p>THIS IS FURTHER EVIDENCE LINKING DIET TO A STRONG IMMUNE SYSTEM. RECOMMENDATIONS REMAIN AS AT 1ST SEPTEMBER 2018 ABOVE.</p> <p>NOTE ESPECIALLY <u>FIGURE 1</u> AS A PARTICULARLY INFORMATIVE SUMMARY OF THE COMPONENTS OF THE IMMUNE SYSTEM, AND <u>FIGURE 2</u> AS A QUICK REFERENCE SHEET SHOWING HOW VARIOUS LIFESTYLE FACTORS CAN COMBINE TO MAKE MATTERS WORSE.</p>
<p>2018 [20th October]</p> <p>Viboud, C. and Lessler, J.</p>	<p>The 1918 influenza pandemic: Looking back, looking forward</p>	<p>THIS PAPER COMMEMORATES THE CENTENARY OF THE 1918 SPANISH FLU PANDEMIC, AND THEN WONDERS - BEFORE COVID-19 - WHAT MIGHT BE COMING NEXT. NOT TOO LONG AND FASCINATING IF YOU LIKE THAT SORT OF THING.</p>
<p>2018 [4th December]</p> <p>Goscé, L. and Johansson, A.</p>	<p>Analysing the link between public transport use and airborne transmission</p>	<p>THIS PAPER REPORTS AN INTERESTING (BUT SLIGHT) CORRELATION WHICH SUGGESTS THAT THE MOST CROWDED LONDON UNDERGROUND LINES SERVE THE SUBURBS WITH THE HIGHEST (SEASONAL) INFLUENZA INCIDENCE, THE IMPLICATION BEING THAT COMMUTER CROWDING HELPS SPREAD THE INFECTION.</p> <p>COMMUNITY VOLUNTEERS TO CONSIDER USING PUBLIC TRANSPORT OFF-PEAK.</p>
<p>2019 [31st January]</p> <p>Tellier, R., et al.</p>	<p>Recognition of aerosol transmission of infectious agents: A commentary</p> <p>Vocab: "Fomite" - any object you touch which can spread a germ to others who also touch it. E.g., door handles, furniture, computers, petrol pumps, supermarket trolleys, etc., etc.</p>	<p>LOTS OF INTERESTING BACKGROUND. FIG 1. SUMS IT UP AND IS WELL WORTH A LOOK. WARNS THAT DROPLETS TRAVEL FURTHER IN MOVING AIR. INCLUDES A SECTION ON CORONAVIRUSES. SARS AND MERS CAN BE A LOT MORE SERIOUS IF CAUGHT BY BREATHING IN, SO TO REDUCE PRESSURE ON THE NHS WE NEED TO PREVENT THIS TYPE OF TRANSMISSION.</p>
<p>2019 [20th February]</p> <p>Asadi, S., et al.</p>	<p>Aerosol emission and superemission during human speech increase with voice loudness</p>	<p>***** NOTE THIS VERY WELL *****</p> <p>THIS STUDY COMPARED RESPIRATORY AEROSOL PRODUCTION WHEN SPEAKING NORMALLY WITH THAT WHEN SPEAKING "AS LOUD AS COMFORTABLE WITHOUT YELLING". IT FOUND THAT THE LOUD CONDITION PRODUCED TEN TIMES AS MUCH AEROSOL AS DID THE NORMAL VOICE CONDITION. CURIOUSLY, SOME SUBJECTS SEEM TO BE NATURAL "SUPEREMITTERS".</p> <p>***** NOTE THIS VERY WELL *****</p> <p>THE POTENTIAL RELEVANCE OF THIS STUDY TO COMMUNITY VOLUNTEERS WILL BECOME APPARENT WHEN YOU GET TO THE ENTRY FOR 29TH MARCH 2020 BELOW.</p>
<p>2019 [16th August]</p> <p>Childs, C. E., et al.</p>	<p>Diet and immune function</p>	<p>THIS PAPER INTRODUCES A SPECIAL EDITION OF THE JOURNAL <i>NUTRIENTS</i>, AND DISCUSSES "THE ROLE OF MACRONUTRIENTS, MICRONUTRIENTS, AND THE GUT MICROBIOME IN MEDIATING IMMUNOLOGICAL EFFECTS". IT SPECIFICALLY MENTIONS SELENIUM, ZINC, AND VITAMIN D, AND THEN POINTS THE READER TO MORE DETAILED SUPPORTING PAPERS.</p>

		THIS IS FURTHER EVIDENCE LINKING DIET TO A STRONG IMMUNE SYSTEM. RECOMMENDATIONS REMAIN AS AT 1ST SEPTEMBER 2018 ABOVE.
2019 [6th September] Velazquez, S., et al.	From one species to another: A review on the interaction between chemistry and microbiology in relation to cleaning in the built environment	THIS IS A LONG AND TECHNICALLY THOROUGH INVESTIGATION OF THE ROLE OF CLEANLINESS (AND PERHAPS EVEN OVER-CLEANLINESS) IN MODERN PUBLIC HEALTH. WRITTEN JUST BEFORE THE COVID-19 OUTBREAK, IT EXPLAINS HOW DIFFERENT TYPES OF CHEMICAL ATTACK DIFFERENT GERMS IN DIFFERENT WAYS.
2019 [18th-27th October]	WUHAN MILITARY WORLD GAMES TAKE PLACE	
2019 [30th October] Ki, H. K., et al.	Risk of transmission via medical employees and importance of routine infection-prevention policy in a nosocomial outbreak of [MERS]	THIS IS A DETAILED CASE STUDY FROM A SOUTH KOREAN HOSPITAL, REINFORCING THE NEED TO STAY ON TOP OF DISINFECTION AND PPE POLICIES LEST THEY LOSE THEIR URGENCY
2019 [17th November]	WUHAN PATIENT ZERO TRACED BACK TO THIS DATE	
2019 [30th December] Jiang, S.-C., et al.	Every 10-fold increase in viral load results in 26% more patient deaths	CONDUCTED JUST PRIOR TO THE COVID-19 EMERGENCY, THIS STUDY PLOTS MORTALITY AGAINST VIRAL LOAD FOR 47 LOCAL OUTBREAKS OF HIGH MORTALITY VIRUSES, AND CONCLUDES THAT "A 10-FOLD INCREASE IN THE VIRAL TITRES RESULTS IN A 26% INCREASE IN THE MORTALITY RATE". IT FOLLOWS THAT ANTIVIRALS NEED TO BE APPLIED EARLY IN TREATMENT.
2020 [13th January] Smith, J. D., et al.	PM_{2.5} on the London Underground	THIS INTERESTING STUDY OF AIRBORNE PARTICULATE MATTER (PM) ON LONDON'S UNDERGROUND TRAINS FINDS THAT 11% OF THE AMBIENT PM IS "ORGANIC CARBON", I.E., DANDER FROM YOUR FELLOW PASSENGERS!
2020 [4th February]	DIAMOND PRINCESS CRUISE SHIP QUARANTINED AT YOKOHAMA	
2020 [6th February] Kampf, G., et al.	Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents	REVIEWS THE LITERATURE ON DISINFECTION PROCEDURES FOR SARS AND MERS, AND FINDS SOME RISK OF INFECTION FROM SURFACES EVEN UP TO 9 DAYS AFTER CONTAMINATION . THE COMMON DISINFECTANTS - BLEACH, ETHANOL, AND HYDROGEN PEROXIDE - WORK WELL AND ARE RECOMMENDED.
2020 [13th February] Wilder-Smith, A and Freeman, D. O.	Isolation, quarantine, social distancing, and community containment: pivotal role for old-style public health measures in the novel coronavirus outbreak Vocab: "Fomite" - any object you touch which can spread a germ to others who also touch it. E.g., door handles, furniture, computers, petrol pumps, supermarket trolleys, etc., etc	THIS PAPER DISCUSSES THE PUBLIC HEALTH MEASURES WHICH HAD SUCCESSFULLY CONTAINED THE 2003 SARS PANDEMIC AND WHICH HAD ALREADY BEEN STRICTLY IMPLEMENTED IN CHINA AND OTHER FAST-REACTING COUNTRIES. IT IDENTIFIES FOUR CRITICAL UNKNOWNNS, NAMELY (1) WHAT IS THE PROPORTION OF ASYMPTOMATICS WHO WILL SLIP THROUGH THE NET, (2) HOW DOES VIRAL SHEDDING VARY WITH COURSE OF INFECTION, (3) IS RESPIRATORY SPRAY THE ONLY AVENUE OF TRANSMISSION, AND HOW MIGHT INFECTED FOMITES EXTEND THE DANGER PERIOD, AND (4) WHAT IS THE TRUE FATALITY RATE. COMMUNITY VOLUNTEERS TO NOTE (1) TO (3).
2020 [13th February] Liu, Y., et al.	The reproductive number of COVID-19 is higher compared to SARS coronavirus	THIS PAPER COMPUTES A REPRODUCTIVE NUMBER R ₀ FOR THE ORIGINAL WUHAN OUTBREAK IN THE RANGE 2-3, WHICH IS ABOUT 40% HIGHER THAN THE WORLD HEALTH ORGANISATION ESTIMATE.
2020 [19th February] Ji, W., et al.	Cross-species transmission of the newly identified coronavirus 2019-nCoV	THIS GENOMICS STUDY SUGGESTS THAT COVID-19 IS A COMBINATION OF A BAT CORONAVIRUS AND ANOTHER YET UNKNOWN (POSSIBLY SNAKE).
2020 [19th February] The Atalanta vs. Valencia Match, Milan	Atalanta vs Valencia Champions League clash was a 'biological bomb' and 'infected 40,000 fans', claims Bergamo mayor A NATURAL EXPERIMENT	IT WAS PERHAPS AN ACCIDENT WAITING TO HAPPEN LETTING SPANISH AND ITALIAN SUPPORTERS SHARE VOICE SPRAY WITH EACH OTHER , AND THEN TAKE IT ALL BACK HOME. IT REMAINS TO BE SEEN WHETHER THE MATCH CONTRIBUTED TO THE SUBSEQUENT COVID-19 HOTSPOTS IN NORTHERN ITALY AND VALENCIA.
2020 [26th February] Zhang, S., et al.	Estimation of the reproductive number of novel coronavirus (COVID-19) and the probable	THIS STUDY NOTES THAT UP TO 16TH FEBRUARY THERE HAD BEEN 355 CONFIRMED COVID CASES ABOARD THE QUARANTINED CRUISE SHIP, AND CALCULATES THE R ₀ FOR THE EARLY STAGES OF THE OUTBREAK AT 2.28.

	outbreak size on the Diamond Princess cruise ship	
2020 [26th February] Rothan, H. A. and Byrareddy, S. N.	The epidemiology and pathogenesis of coronavirus disease	THIS PAPER GIVES A HELPFUL OPENING TIMELINE FOR THE PANDEMIC IN CHINA BETWEEN DECEMBER 2019 AND 16TH FEBRUARY 2020. IT THEN BECOMES RATHER TECHNICAL WHEN IT DISCUSSES SYMPTOMS AND TREATMENTS.
2020 [27th February] The Wolves vs Espanyol Match	A NATURAL EXPERIMENT	IT WAS PERHAPS AN ACCIDENT WAITING TO HAPPEN LETTING WOLVERHAMPTON SUPPORTERS FLY OUT, SHARE VOICE SPRAY WITH EACH OTHER AND THEIR SPANISH HOSTS , AND THEN FLY IT ALL BACK HOME. IT REMAINS TO BE SEEN WHETHER THE MATCH CONTRIBUTED TO THE SUBSEQUENT COVID-19 HOTSPOT IN THE WEST MIDLANDS.
2020 [28th February] Rocklöv, J., et al.	COVID-19 outbreak on the Diamond Princess cruise ship: Estimating the epidemic potential and effectiveness of public health countermeasures	THIS PAPER EXPLAINS HOW RAPID PUBLIC HEALTH MEASURES BROUGHT DOWN THE REPRODUCTIVE NUMBER R_0 FROM AN INITIALLY FEARED 14.8 TO A COMPUTED 1.78. THERE IS SOME SUGGESTION, HOWEVER, THAT AN EARLIER EVACUATION IN FAVOUR OF QUARANTINE ASHORE WOULD HAVE BEEN MORE EFFECTIVE THAN KEEPING PASSENGERS ABOARD.
2020 [5th March] Wilder-Smith, A., et al.	Can we contain the COVID-19 outbreak with the same measures as for SARS?	THIS PAPER EXPRESSES UNCERTAINTY ABOUT WHAT MEASURES WILL IN DUE COURSE PROVE EFFECTIVE AGAINST COVID-19. UNTIL THEN, WE ARE FORCED TO RELY ON QUARANTINE AND TRACING TO FLATTEN THE INFECTION CURVE.
2020 [9th March] Ebrahim, S. H. and Memish, Z. A.	COVID-19 - the role of mass gatherings	THIS PAPER WARNS THAT "MASS GATHERINGS" SHOULD BE CANCELLED AS A MATTER OF PRIORITY EARLY IN A PANDEMIC TO FLATTEN THE INFECTION CURVE. THEY ARE, HOWEVER, TALKING ABOUT MEGA EVENTS LIKE THE OLYMPICS AND MARDIS GRAS, RATHER THAN FOOTBALL MATCHES AND RACE MEETINGS.
2020 [9th March-14th April] The USS Theodore Roosevelt Outbreak	The battle of USS Theodore Roosevelt: A timeline A NATURAL EXPERIMENT	THIS HIGHLY LOCALISED OUTBREAK AMONGST THE 5000 CREW MEMBERS OF AN AMERICAN WARSHIP SEEMS TO HAVE BEEN BROUGHT ON SHIP 9TH MARCH 2020 BY SAILORS RETURNING FROM THE NIGHTSPOTS OF DANANG, VIETNAM. THE SHIP DEPARTED FOR GUAM THE NEXT DAY AND THE INFECTION THEN SPREAD THROUGH THE VARIOUS MESSES AND DUTY SPACES.
2020 [10th March] Lauer, S. A., et al.	The incubation period of coronavirus disease	THIS PAPER ANALYSES THE CASENOTES FOR 181 COVID PATIENTS WITH KNOWN OR PRESUMED EXPOSURE DURING THE EARLY WEEKS OF THE WUHAN OUTBREAK. IT ESTIMATES AN MEAN INCUBATION PERIOD OF 5.5 DAYS. COMMUNITY VOLUNTEERS TO NOTE.
2020 [10th March] DCMO Jenny Harries	Press conference statement as Deputy Chief Medical Officer Have been unable to locate an official transcript, but here's the BBC News write-up .	IN THIS STATEMENT, THE DCMO ASSURES THE COUNTRY THAT OUTSIDE EVENTS LIKE FOOTBALL MATCHES AND RACE MEETINGS ARE "RELATIVELY SAFE". UNFORTUNATELY FOR THE POPULATION AT LARGE, THE WEIGHT OF EVIDENCE LISTED ABOVE CONCERNING RESPIRATORY AEROSOLS INDICATES RATHER THAT THEY ARE MOST CLEARLY EXTREMELY UNSAFE. COMMUNITY VOLUNTEERS TO NOTE AND PASS ON.
2020 [10th-13th March] The Cheltenham Race Festival	A NATURAL EXPERIMENT	IT WAS PERHAPS AN ACCIDENT WAITING TO HAPPEN LETTING 125,000 RACING FANS SHARE VOICE SPRAY BOTH WITH EACH OTHER AND LOCAL HOSPITALITY AND TRACK STAFF , THEREBY BECOMING THE No. 1 SUSPECT FOR THE GLOUCESTER COVID-19 HOTSPOT.
2020 [11th March] The Liverpool vs. Atlético Match	It was wrong to play against Atlético says Liverpool's public health director A NATURAL EXPERIMENT	IT WAS PERHAPS AN ACCIDENT WAITING TO HAPPEN LETTING 3000 SPANISH SUPPORTERS FLY IN AND SHARE VOICE SPRAY WITH THEIR HOSTS , THEREBY BECOMING THE No. 1 SUSPECT FOR THE SOUTH LANCS. COVID-19 HOTSPOT.
2020 [12th March] The Ticino Lockdown	As virus spreads, Ticino curbs social life	THE SWISS AUTHORITIES DECLARE A "STATE OF NECESSITY" IN TICINO PROVINCE, JUST OVER THE BORDER WITH NORTHERN ITALY.

<p>2020 [14th-15th March] The Stereophonics Concerts, Cardiff</p>	<p>Chinese netizens rendered speechless by crowded Stereophonics concert in U.K. <u>A NATURAL EXPERIMENT</u></p>	<p>IT WAS PERHAPS AN ACCIDENT WAITING TO HAPPEN LETTING FANS SHARE VOICE SPRAY WITH EACH OTHER, AND THEN TAKE IT ALL BACK HOME. IT REMAINS TO BE SEEN WHETHER THE CONCERTS CONTRIBUTED TO THE SUBSEQUENT COVID-19 HOTSPOT IN SOUTH WALES.</p>
<p>2020 [16th March] Ferguson, N. M. et al.</p>	<p>Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand Self-published by the COVID-19 Response Team at Imperial College, London, as a World Health Organisation collaborating centre for infectious disease modelling Vocab: "Non-Pharmaceutical Interventions (NPIs)" - healthcare or Personal Protection Measures (PPMs) not requiring medicines or medical treatment (e.g. hand-washing).</p>	<p>THIS PAPER REPORTS THE LATEST PREDICTIONS MADE BY THE IMPERIAL MODEL AS TO THE LIKELY EFFECTIVENESS OF NPIs IN FIGHTING COVID-19. THE MOST EFFECTIVE PACKAGE OF PROTECTIONS IS "A COMBINATION OF SOCIAL DISTANCING OF THE ENTIRE POPULATION, HOME ISOLATION OF CASES, AND HOUSEHOLD QUARANTINE OF THEIR FAMILY MEMBERS". THE MODELLERS WORRY THAT THESE PROTECTIONS MIGHT NEED TO BE IN PLACE FOR "POTENTIALLY 18 MONTHS", BECAUSE IF RELAXED TOO EARLY THE INFECTION CURVES "WILL QUICKLY REBOUND".</p> <p>*****</p> <p>COMMUNITY VOLUNTEERS MAY TAKE SATISFACTION IN BEING A VITAL PART OF THIS PACKAGE OF PROTECTIONS!!</p> <p>*****</p>
<p>2020 [19th March] Zou, L., et al.</p>	<p>SARS-CoV-2 viral load in upper respiratory specimens of infected patients</p>	<p>THIS PAPER SHOWS GRAPHS OF VIRAL LOAD DAY BY DAY FOR 17 SYMPTOMATIC AND 1 ASYMPTOMATIC COVID PATIENTS. THEIR DATA ARE SUMMARISED GRAPHICALLY (THEIR FIGURE 1), AND SHOW MOST PATIENTS CLEAR AT AROUND 9 DAY AFTER FIRST SYMPTOMS. HOWEVER A SMALL NUMBER OF OUTLIER PATIENTS STILL HAD DETECTABLE VIRAL LOAD AFTER 15 DAYS.</p> <p>COMMUNITY VOLUNTEERS TO NOTE. A PRINTED COPY OF FIGURE 1 MIGHT BE USEFUL.</p>
<p>2020 [19th March] Thomas, R. and McLellan, A.</p>	<p>Coronavirus deaths cluster appears in the West Midlands</p>	<p>SEE ENTRY 27TH FEBRUARY CONCERNING THE WOLVES-ESPANYOL FOOTBALL MATCH.</p>
<p>2020 [26th March] Li, Q., et al.</p>	<p>Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia</p>	<p>THIS PAPER ANALYSES THE CASE DETAILS TAKEN FROM THE FIRST 425 COVID-19 PATIENTS IN WUHAN. APART FROM GIVING LOTS OF INTERESTING DATES AND NUMBERS IT REPORTS AN R₀ OF 2.2.</p>
<p>2020 [27th March] Iacobucci, G.</p>	<p>Lack of PPE in care homes is risking spread of virus, leaders warn BMJ parliamentary diary entry.</p>	<p>THIS IS A SHORT AND HIGHLY TOPICAL UPDATE ON THE LIKELIHOOD OF THE CARE HOME SECTOR BEING ABLE TO COPE, GIVEN A LEGACY SHORTAGE OF PPE SHORTAGES AND STAFF VACANCIES. THE AUTHOR IS PARTICULARLY CONCERNED AT PATIENTS TRANSFERRING BACK AND FORTH BETWEEN HOSPITAL AND CARE HOME WHEN THERE IS NO SUFFICIENTLY ACCURATE TEST OF INFECTIVITY.</p>
<p>2020 [29th March] Read, R.</p>	<p>A choir decided to go ahead with rehearsal. Now dozens of members have COVID-19 and two are dead</p>	<p>THE TITLE SAYS IT ALL. COMMUNITY VOLUNTEERS TO NOTE THE DISTINCT RISK OF RAISED VOICE SOCIALISING.</p>
<p>2020 [31st March] Goh, G.K., et al.</p>	<p>Shell disorder analysis predicts greater resilience of [COVID-19] outside the body and in body fluids</p>	<p>BY ANALYSING THE PROTEIN STRUCTURE OF THE COVID-19 VIRUS THE AUTHORS CONCLUDE THAT ITS "SHELL" IS MORE RESISTANT TO ENVIRONMENTAL DAMAGE THAN OTHER CORONAVIRUSES. THIS WILL LIKELY AFFECT THE PATTERN OF PROGRESSION OF THE PANDEMIC BECAUSE THOSE INFECTED "CAN SHED MORE INFECTIOUS PARTICLES".</p>
<p>2020 [3rd April] Asadi, S., et al.</p>	<p>The coronavirus pandemic and aerosols: Does COVID-19 transmit via expiratory particles? ESSENTIAL READING</p>	<p>THIS PAPER IS A SHORT EMERGENCY UPDATE ON THE TRANSMISSION OF COVID-19 BY RESPIRATORY AEROSOLS.</p> <p>THE GENERAL QUESTION IS **WHY** THE DISEASE IS SO TRANSMISSIBLE, AND THE SPECIFIC QUESTION IS WHAT ROLE DO AEROSOLS PLAY IN THAT TRANSMISSION?</p> <p>MUCH OF THE UNCERTAINTY ARISES BECAUSE ASYMPTOMATIC CONTACTS ARE DIFFICULT TO TRACE, AND BECAUSE "ORDINARY SPEECH AEROSOLISES SIGNIFICANT QUANTITIES OF RESPIRATORY PARTICLES". SO NO COUGH, NO CAUTION.</p> <p>THERE ALSO EXIST "SPEECH SUPEREMITTERS" WHO, IF INFECTED, CAN PRODUCE 600 DROPLETS PER MINUTE IN</p>

		<p>NORMAL CONVERSATION, ANY ONE OF WHICH IS ENOUGH TO INFECT SOMEONE INHALING IT.</p> <p>RESEARCHERS ARE NOW URGENTLY ADDRESSING THESE QUESTIONS.</p> <p>COMMUNITY VOLUNTEERS TO NOTE, AND PERHAPS TRY TO GET EVERYBODY TO SPEAK MORE SOFTLY AND MASK UP.</p>
2020 [7th April] Mahase, E.	COVID-19: What is the evidence for cloth masks	<p>THIS SHORT <i>BMJ</i> FEATURE CONSIDERS SOME VERY RECENT EVIDENCE FOR AND AGAINST HOME-MADE CLOTH MASKS. THE SITUATION SEEM TO BE THAT CLOTH MASKS ARE BETTER THAN NOTHING, PROVIDED THEY ARE REGULARLY RECYCLED WITH CLEAN ONES. THE BEST APPLICATION SEEMS TO BE "FOR SHORT PERIODS OF TIME BY PARTICULARLY VULNERABLE INDIVIDUALS WHEN IN TRANSIENT HIGHER RISK SITUATIONS". THEY ALSO HELP FLATTEN THE EPIDEMIC CURVE.</p> <p>COMMUNITY VOLUNTEERS TO NOTE.</p>
2020 [7th April] Wu, Z. and McGoogan, J. M.	Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72,314 cases from the Chinese Center for Disease Control and Prevention CONTAINS VALUABLE OUTBREAK DATES AND CASE BREAKDOWN DATA	<p>THIS JAMA REPORT PROVIDES AN EARLY EPIDEMIOLOGICAL BREAKDOWN OF THE 72,314 CASES KNOWN TO THE CHINESE NHS AS AT 11TH FEBRUARY 2020 (AND THEY ONLY HAD 84,018 THREE MONTHS LATER!). IT NOTES, E.G., 2% CASES AGED UNDER 19 YEARS, 5% OF CASES WENT CRITICAL, 3.8% OF CONFIRMED CASES WERE HEALTH CARE PERSONNEL, ETC. ETC.</p> <p>COMMUNITY VOLUNTEERS TO NOTE AND BEAR IN MIND</p>
2020 [10th April] Wei, W.E., et al.	Presymptomatic transmission of SARS-CoV-2, Singapore, January 23-March 16, 2020	<p>THIS PAPER REPORTS THAT THE INFECTION PATTERN IN SINGAPORE BETWEEN 23 JAN AND 16 MAR WAS CONSISTENT WITH PATIENTS BECOMING INFECTIOUS 1-3 DAYS BEFORE ANY SYMPTOMS EMERGE. THE AUTHORS THEREFORE CONCLUDE THAT THIS "UNDERScores THE CRITICAL ROLE SOCIAL DISTANCING, INCLUDING AVOIDANCE OF CONGREGATE SETTINGS, PLAYS IN CONTROLLING THE COVID-19 PANDEMIC".</p> <p>COMMUNITY VOLUNTEERS TO NOTE.</p>
2020 [10th April] Morawska, L. and Cao, J.	Airborne transmission of SARS-CoV-2: The world should face the reality	<p>THIS PAPER MAKES THE CASE THAT "HAND WASHING AND MAINTAINING SOCIAL DISTANCE ARE THE MAIN MEASURES RECOMMENDED BY THE WORLD HEALTH ORGANIZATION (WHO) TO AVOID CONTRACTING COVID-19. UNFORTUNATELY, THESE MEASURES DO NOT PREVENT INFECTION BY INHALATION OF SMALL DROPLETS EXHALED BY AN INFECTED PERSON THAT CAN TRAVEL ... METERS OR TENS OF METERS IN THE AIR AND CARRY THEIR VIRAL CONTENT."</p> <p>COMMUNITY VOLUNTEERS TO NOTE.</p>
2020 [12th April] Howard, J., et al.	Face masks against COVID-19: An evidence review. STILL UNDER PEER REVIEW	<p>A LONG AND DETAILED EVALUATION INVOLVING EXPERTS FROM MANY UNIVERSITIES AND HOSPITALS, WHICH JUDGES THAT NON-MEDICAL MASKS CAN SUCCESSFULLY OBSTRUCT INFECTIOUS DROPLETS. MASK USE SHOULD BE WIDESPREAD BECAUSE IT IS COMMON FOR INFECTED PERSONS "TO HAVE FEW OR NO SYMPTOMS". MASK WEARING MAY BE CRITICAL TO PREVENTING A SECOND WAVE OF INFECTIONS.</p>
2020 [16th April] van Deremalen, N. and Bushmaker, T.	Aerosol and surface stability of SARS-CoV-2 as compared to SARS-CoV-1 (Letter to the Editor of the <i>NEJM</i>)	<p>THIS LETTER TO THE EDITOR OF THE <i>NEJM</i> CONTAINS THE WORRYING REPORT THAT COVID-19 CAN REMAIN INFECTIOUS IN AEROSOLS FOR AT LEAST 3 HOURS. AND ON SURFACES "UP TO DAYS".</p> <p>COMMUNITY VOLUNTEERS MAY CARE TO ADJUST THEIR DISTANCING, MASKING, AND DISINFECTING PROCEDURES ACCORDINGLY.</p>
2020 [25th April] Correia, G., et al.	Airborne route and bad use of ventilation systems as non-negligible factors in SARS-CoV-2 transmission	<p>THIS PAPER REPORTS "GROWING EVIDENCE" THAT COVID-19 IS TRANSMITTED AS A VERY FINE AIRBORNE AEROSOL (TO BE BREATHED IN AT A DISTANCE) AS WELL AS BY LARGER AIRBORNE DROPLETS (WHICH CAN BE BREATHED IN BY CLOSE COMPANIONS, OR ELSE FALL TO GROUND AND BECOME A CONTACT INFECTION RISK).</p> <p>EXISTING MEASURES ALREADY TAKE THIS FINDING INTO ACCOUNT, BUT BE ESPECIALLY ALERT FOR CONTACTS IN AREAS OF POOR VENTILATION.</p>

<p>2020 [1st May] Petersen, E., et al.</p>	<p>Transmission of respiratory tract infections at mass gathering events</p>	<p>THIS PAPER ANALYSES PUBLIC HEALTH REPORTS FROM PAST RUNS OF THE MUSLIM HAJJ PILGRIMAGE, AND CONCLUDES VERY PLAINLY THAT "RESPIRATORY TRACT INFECTIONS ARE A MAJOR CAUSE OF MORBIDITY IN PILGRIMS ATTENDING MASS GATHERING EVENTS".</p>
<p>2020 [1st May] Leclerc, Q. J., et al.</p>	<p>What settings have been linked to SARS-CoV-2 transmission clusters?</p>	<p>THIS PAPER REPORTS THE MOST LIKELY LOCATIONS FOR COVID-19 INFECTION. IN ORDER OF LIKELIHOOD, THE INDOOR LOCATIONS INCLUDE HOUSEHOLD, CARE HOME, SHOPS, BARS, AND SCHOOLS, AND THE OUTDOOR SITES INCLUDE CONSTRUCTION SITES AND SPORTS GATHERINGS.</p> <p>CONFIRMS WHAT WE ALREADY SUSPECTED</p>
<p>2020 [9th May] The Lancet Editorial</p>	<p>COVID-19 in Brazil: "So What?" [NOT YET ONLINE]</p>	<p>THIS EDITORIAL LOOKS AT THE PROGRESSION OF THE PANDEMIC IN BRAZIL, WHICH PRESENTLY HAS THE WORLD'S WORST R0 (=2.81). THEIR PRESIDENT SAYS: SO WHAT?" THE COUNTRY HAS 13 MILLION PEOPLE IN CROWDED SLUMS. WE SHALL SEE WHAT IN DUE COURSE.</p>
<p>2020 [13th May] Stadnytskyi, V., et al.</p>	<p>The airborne lifetime of small speech droplets and their potential importance in SARS-CoV-2 transmission</p>	<p>THIS UP-TO-DATE PAPER REPORTS ON EXPERIMENTS WITH LASER SCANNING OF RESPIRATORY SPRAY DURING PHONATION - SPEAKING - AND CONCLUDES THAT "THERE IS A SUBSTANTIAL PROBABILITY THAT NORMAL SPEAKING CAUSES AIRBORNE VIRUS TRANSMISSION IN CONFINED ENVIRONMENTS".</p> <p>THIS CONFIRMS ADVICE GIVEN EARLIER</p>