



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

Multimorbidity, polyiatrogenesis, and COVID-19

Citation for published version:

Ecks, S 2020, 'Multimorbidity, polyiatrogenesis, and COVID-19', *Medical Anthropology Quarterly*.
<https://doi.org/10.1111/maq.12626>

Digital Object Identifier (DOI):

[10.1111/maq.12626](https://doi.org/10.1111/maq.12626)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Peer reviewed version

Published In:

Medical Anthropology Quarterly

Publisher Rights Statement:

This is the peer reviewed version of the following article: Ecks, S. (2020), Multimorbidity, Polyiatrogenesis, and COVID19. *Medical Anthropology Quarterly*, which has been published in final form at <https://doi.org/10.1111/maq.12626>. This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Self-Archiving.

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



Medical Anthropology Quarterly

Multimorbidity, Polyiatrogenesis, and COVID-19

Journal:	<i>Medical Anthropology Quarterly</i>
Manuscript ID	MAQ-Mar-2020-OA-0026.R4
Manuscript Type:	Original Article

SCHOLARONE™
Manuscripts

Multimorbidity, Polyiatrogenesis, and COVID-19

Abstract

To date, the strongest predictor for dying with COVID-19 is suffering from several chronic disorders prior to the viral infection. Pre-existing multimorbidity is highly correlated with socioeconomic inequality. In turn, having several chronic conditions is closely linked to multiple medication intake, especially in richer countries with good access to biomedical care. Owing to its vertical structure, biomedicine often risks giving multiple treatments in an uncoordinated way. Such lack of integrated care can create complex forms of iatrogenic harm. Multimorbidity is often exacerbated by a pharmaceuticalization of social deprivation in place of integrated care. In this article, I explore the possibility that clusters of overmedication are a contributing factor to higher death rates from COVID-19, especially in poorer areas within richer countries.

Anthropological perspectives on the social embeddedness of multimorbidity and multiple medication use can expand our understanding of who is most vulnerable to SARS-CoV-2.

"We really need to get data and we need to get data fast"

On March 18, 2020, Dr. Anthony Fauci and Dr. Howard Bauchner discussed a possible link between hypertension medications and a heightened risk of dying with a coronavirus infection. Bauchner is the Editor of JAMA, the Journal of the American Medical Association. Fauci directs the US National Institute of Allergy and Infectious Diseases. After joining the White House Coronavirus Task Force, Fauci became the world's most famous scientific advisor on COVID-19. In this conversation, Fauci highlighted possible links between ACE (angiotensin converting enzyme) inhibitors and COVID-19 fatalities. Fauci said that ACE inhibitors can increase "the expression of the receptors for the virus" (JN Learning 2020). Fauci was struck by reports from Italy that the vast majority of those who died with COVID-19 suffered from hypertension. Italy-- then the European epicenter of the pandemic--was a rich country with excellent access to medical care, and many COVID-19 victims had been taking ACE inhibitors to treat their hypertension. "Why should someone who has hypertension that's well controlled have a much greater chance of dying than somebody else with any other kind of underlying condition?," Fauci asked. "We really need to get data and we need to get data fast" (JN Learning 2020). Fauci's concern is both about the clinic and the population. Significant patterns on a population level (here, Italian death rates) flag up patterns in clinical practice (widespread use of ACE inhibitors), which then lead to an exploration of pathogenesis (ACE inhibitors, cell receptors). I agree with Fauci that a careful

1
2
3 triangulation of pharmacological, clinical, epidemiological, and social science evidence is
4
5
6 necessary to understand the action of the virus, how it spreads, and who is most
7
8
9 vulnerable to it.

10
11 In the months following Fauci's call for data, a handful of medical articles appeared
12
13 that examined the link between COVID-19 and antihypertensive drugs. The results were
14
15 said to be inconclusive because none of the studies "adjusted for confounding variables"
16
17 and so it remained unclear "if this association [between antihypertensives and high
18
19 death rates] is related to the pathogenesis of hypertension or another associated
20
21 comorbidity or treatment" (Patel & Verma 2020). The American Heart Association, a
22
23 nonprofit organization that funds cardiological research and patient education,
24
25 continued to recommend ACE inhibitors. In the absence of certainty about increased risk
26
27 from ACE inhibitors, they told patients: "continue taking all your medications as
28
29 prescribed, including ACE inhibitors ... If you are diagnosed with COVID-19, you
30
31 should be fully evaluated before adding or removing any treatments ... your overall
32
33 medical condition is much better if your blood pressure and diabetes are optimally
34
35 controlled" (AHA 2020).
36
37
38
39
40
41
42
43
44
45

46
47 Fauci's call that "we need to get data fast" was only heard for ACE inhibitors but not
48
49 for other medications, and possible links between the pathogenesis of COVID-19 and
50
51 complex medication patterns remain entirely unknown. I argue that Fauci's challenge
52
53 remains as important now as it was at the beginning of the pandemic. There are at least
54
55
56
57
58
59
60

1
2
3 two ways that chronic pharmaceutical use might put people at a higher risk of dying
4
5
6 with COVID-19. One is that medications could directly augment virulence and
7
8
9 pathogenesis (as intimated by Fauci). Another is that overtreatment adds to the overall
10
11 morbidity index, regardless of any specific drug mechanism, thus making an
12
13
14 overmedicated patient less healthy and less able to resist succumbing to the disease. In
15
16
17 what follows, I will explore the possibility that multiple medication intake may lead to
18
19
20 poor outcomes for coronavirus by this pathway. My goal is to show how medical
21
22
23 anthropology, especially an anthropology of pharmaceuticals, may add a less obvious
24
25
26 path in explaining the global impact of COVID-19 than that taken by virologists or
27
28
29 epidemiologists.

30
31 While the pandemic modelling first anticipated that the coronavirus would behave
32
33 like influenza, researchers realized that COVID-19 is a "complex multi-system clinical
34
35 syndrome" (Roberts et al. 2020) that has a completely different trajectory than influenza.
36
37
38 According to clinical reports as of this writing, the virus starts to spread in the lungs but
39
40
41 can go on to attack all other organs, including the brain. Even when a patient survives
42
43
44 the virus infection, the long-term effects, such as cognitive impairment, psychological
45
46
47 distress, or reduced lung capacity, can be severe and protracted. Some of the long-term
48
49
50 harm may even be caused by "iatrogenic damage" (Roberts et al. 2020), which comes
51
52
53 from clinical uncertainty over how to best treat those with severe COVID-19 symptoms.
54
55
56 It is now better understood that treating COVID-19 as if it was a form of pneumonia, e.g.
57
58
59
60

1
2
3 by connecting all patients with low oxygen levels to ventilators, may do more harm than
4
5
6 good (Marini and Gattinoni 2020). The pathogenesis I will explore here is the one that
7
8 connects victims' multiple chronic health problems to the risks of dying with COVID-19
9
10 specifically because of victims' multiple chronic medication histories. Could it be that
11
12 socioeconomic deprivation coupled with chronic medication consumption is a predictor
13
14 of dying with a SARS-CoV-2 infection?
15
16
17
18

19 To date, one medical study has appeared that shows polypharmacy being strongly
20
21 correlated with the risk of *catching* Sars-CoV-2. In an analysis of half a million UK
22
23 biobank users, McQueenie and colleagues found “that there was a clear dose
24
25 relationship whereby the risk of a COVID-19 positive test rose steadily with
26
27 polypharmacy level” (2020: 15). This study did not identify which kinds of medications
28
29 were used, and it only explored infection risks.
30
31
32
33
34
35

36 My approach picks up on these threads from the medical literature to explore social
37
38 factors linked to the spread and impact of the pandemic. First, I explore the social causes
39
40 of multimorbidity and overmedication in relation to socioeconomic deprivation in one of
41
42 the UK's most deprived areas where I recently conducted fieldwork. I then offer case
43
44 studies that demonstrate how multiple medication use exacerbates patients' health. In
45
46 the final section I explore population-level links between chronic illness, chronic
47
48 medication use, and dying from an acute coronavirus infection. My suggestion is that
49
50 medication patterns should be considered in studies on pathogenesis and epidemiology.
51
52
53
54
55
56
57
58
59
60

1
2
3 COVID-19 death rates seem to be highest (1) where a country has high rates of
4
5
6 multimorbidity; (2) where multimorbidity is deepened by high levels of social
7
8
9 inequality; (3) where the health system enables easy access to multiple medications; and
10
11 (4) where multiple chronic treatments are insufficiently integrated. In wealthy countries,
12
13
14 COVID-19 appears to claim most victims in poorer pockets *within* richer regions, and
15
16
17 complex medication regimes might be a missing piece in this puzzle. Anthropological
18
19
20 perspectives might offer novel ways of conceptualizing not just the social but also the
21
22
23 epidemiological contours of the pandemic as problems of “local biologies” (Lock and
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000

Uncovering multimorbidity

The clinical and epidemiological findings on COVID-19 and multimorbidity are, by now, fairly robust. From early on, medical reports found strong links between underlying health conditions and COVID-19. The majority of people infected with SARS-CoV-2, by some estimates 78%, remain asymptomatic (Day 2020). A minority of infected people experience mild to moderate flu symptoms. In perhaps 1% of people infected, COVID-19 turns fatal. Whether a SARS-CoV-2 infection kills seems highly correlated on the presence of pre-existing problems. The origins and forms of multimorbidity are thus extremely important for understanding global COVID-19 mortality patterns.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37

Already the first studies of mortality in China's Wuhan city showed that almost all the people who died with the virus had pre-existing disorders (Novel Coronavirus Response Team 2020). The data from China highlighted heart disease, diabetes, chronic respiratory disease, high blood pressure, and cancer (Novel Coronavirus Response Team 2020). Studies from around the world confirmed these findings. A study among patients admitted to New York City hospitals (Richardson, Hirsch & Narasimhan 2020) found similar conditions, especially hypertension (56.6% of COVID-19 patients), obesity (41.7%), and diabetes (33.8%). 21% of the COVID-19 patients admitted to NYC hospitals died. Using an assessment tool called the Charlson Comorbidity Index (CCI), which predicts 10-year survival rates in patients with multiple chronic problems, this study found that among all the patients admitted to New York City hospitals with a SARS-CoV-2 infection, half were expected to die of existing morbidities within the next 10 years.

38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Forensic pathologists in the German city of Hamburg performed full autopsies on hundreds of COVID-19 victims. In *every* case they found one or more of these pre-existing conditions: heart disease, asthma, chronic obstructive pulmonary disease, peripheral artery disease, diabetes, obesity, or a neurodegenerative disease (Wichmann, Sperhake, Lütgehetmann et al. 2020). The Hamburg study discovered at least one pre-existing condition in every patient examined, and multimorbidity in the majority of cases. The findings from Hamburg were widely reported in German media. Dr. Klaus

1
2
3 Püschel, the Director of the Hamburg Institute for Forensic Medicine, argued that SARS-
4
5 CoV-2 is not nearly as serious a threat to the general population as it was believed to be.
6
7
8 No one dies *only* of a SARS-CoV-2 infection, he said. At least one underlying health
9
10
11 problem is always present (Wunder 2020).
12
13

14 Multimorbidity occurs when the same person suffers from two or more chronic
15
16 disorders, which can be noncommunicable, infectious, or mental (Academy of Medical
17
18 Sciences 2018: 6). There is no agreed way of how to measure multimorbidity: some
19
20 researchers classify multimorbidity by how many disorders occur together, while others
21
22 look for systematic clusters among co-occurring problems. What problems are counted in
23
24 one of these clusters also varies, some researchers consider only a handful of chronic
25
26 disorders as constitutive of multimorbidity (Dugravot et al. 2020), while others capture
27
28 dozens of conditions (Payne 2020). Multimorbidity overlaps with other constructs, such
29
30 as "frailty" (Hanlon et al. 2018) and "disability" (Stineman 2012).
31
32
33
34
35
36
37

38 The notion of "comorbidity," as the coexistence of an "index" disorder and a
39
40 secondary disorder, emerged in the 1970s (Weaver, Barrett & Nichter 2016). Research
41
42 into *multimorbidity* as a more complex category of diagnosis was almost inexistent a
43
44 decade ago, but took off when the epidemic spread of co-occurring chronic disorders
45
46 came into view (Busija et al. 2019: 1). Rising rates of multimorbidity have become a
47
48 concern for both clinicians and epidemiologists. In rich countries, multimorbidity makes
49
50 up 25-50% of the overall disease burden (Garin et al. 2016; van der Aa et al. 2017). In the
51
52
53
54
55
56
57
58
59
60

1
2
3 UK, for example, multimorbid conditions account for 50% of GP appointments, 64% of
4
5
6 outpatient appointments, 70% of inpatient bed days, and 70% of total health
7
8
9 expenditures (Aiden 2018: 4). Longer lifespans mean more multimorbidity: the older
10
11 people are, the more chronic health problems they have. Up to two thirds of people over
12
13
14 65 are multimorbid. Treating older patients accounts for the majority of all health
15
16
17 expenditures (Kaufman 2015).

18
19 Multimorbidity is strongly correlated with protracted medication uses. About half of
20
21
22 older adults in richer countries are on five or more medications (Mangin & Garfinkel
23
24
25 2019: 1). The pharmaceutical industry promotes the regular consumption of five or more
26
27
28 medications as necessary for the maintenance of health. For the industry, chronic
29
30
31 polypharmacy is recommended as the new normal because multimorbidity is now
32
33
34 normal. Already a decade ago, people in richer countries were on nine to thirteen
35
36
37 prescription drugs in any given year (Dumit 2012: 2). Regimes of chronic polypharmacy
38
39
40 originated in the US in the 2000s but have become normalized across the world
41
42
43 wherever drugs are affordable and accessible.

44
45 Multimorbidity is not a new condition, as there have always been people with more
46
47
48 than two health issues at the same time. But the growth of multimorbidity diagnoses and
49
50
51 the biomedical focus on it are new. Dr. Chris Whitty, the UK government's chief advisor
52
53
54 on COVID-19, argued in January 2020--just when the pandemic hit--that multimorbidity
55
56
57 did not come into view for so long because biomedicine is organized "vertically" along
58
59
60

1
2
3 specific diseases, while a "horizontal" understanding of simultaneous disorders is
4
5 lacking (Whitty et al. 2020: 1). Verticality increases the risk of iatrogenesis by way of
6
7 multiple uncoordinated treatments. As others have shown, this verticality is itself an
8
9 artefact of reliance on a biomedical model that tries to isolate causes of disorders and to
10
11 develop therapies that are reductionistic (White 2006: 141-142). Although multimorbidity
12
13 is a recognized and proliferating problem, research on the interactions between
14
15 multimorbidity and protracted medication use is still largely absent.
16
17
18
19
20
21

22 Current biomedical research on multimorbidity could be of use in mapping possible
23
24 research avenues in relation to Covid-19. Some of this explores nonrandom clusters of
25
26 disorders (Academy of Medical Sciences 2018: 5; Busjia 2019). Other research explores
27
28 how socioeconomic inequality congeals and expands chronic disease clusters. The most-
29
30 cited study on multimorbidity is by Barnett and colleagues (2012). In this study, Scottish
31
32 patient health records were scrutinized, and showed a strong correlation between
33
34 socioeconomic deprivation and multimorbid suffering. A decade ago, already 23.2% of
35
36 all Scottish patients were multimorbid and a third of these multimorbid patients had
37
38 both mental and physical problems. Socioeconomic deprivation shifted the onset of
39
40 multimorbidity forward: "young and middle-aged adults living in the most deprived
41
42 areas had rates of multimorbidity equivalent to those aged 10-15 older in the most
43
44 affluent areas" (2012: 39). In deprived neighborhoods, people in their 40s and 50s are as
45
46 likely to have multiple chronic problems as 60 or 70-year olds in the average population.
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 Barnett's (2012) quantitative results tally with qualitative studies on GPs' "endless
4
5 struggle" with multimorbidity in deprived areas (O'Brien et al. 2011; Lawson et al. 2013).
6
7
8 All available data suggest that multimorbidity keeps rising.
9

10
11 Even when multimorbidity is recognized by clinicians, there are few therapeutic
12
13 protocols to deal with it (Guthrie et al. 2012). Given the logic of pharmaceutical
14
15 industries, multimorbidity will continually escalate the number of pills required for
16
17 treating the average patient. The more a health system is compartmentalized by
18
19 specialization, the more likely it is that multimorbidity goes unrecognized as a problem
20
21 of its own. Patients with multiple chronic problems experience biomedical care as
22
23 lacking coherence (Schjøtz, Høst & Frølich 2016).
24
25
26
27
28

29
30 Some of the most important work in anthropology on multimorbidity is on
31
32 "syndemics," which are "aggregation[s] of two or more diseases or other health
33
34 conditions in a population in which there is some level of deleterious biological or
35
36 behaviour interface that exacerbates the negative health effects of any or all of the
37
38 diseases involved" (Singer et al. 2017: 941). The syndemics approach "move[s] beyond
39
40 common medical conceptualisations of comorbidity and multimorbidity" (ibid.) by
41
42 emphasizing structural violence (Farmer 1996) and social suffering (Kleinman, Das &
43
44 Lock 1997). Syndemics researchers identify a number of multimorbid cluster patterns.
45
46
47 For example, Mendenhall (2012; 2016) describes a pattern of "violence, immigration,
48
49 depression, type 2 diabetes, and abuse" (VIDDA) among Mexican immigrant women
50
51
52
53
54
55
56
57
58
59
60

1
2
3 living in the US. "Immigration" tears families apart and leads to social isolation.
4
5

6 "Depression" is conditioned by traumatic childhood experiences and diminished self-
7
8 efficacy. "Diabetes" is co-constituted by gender roles and food preferences. "Structural
9
10 violence" includes living in unsafe neighborhoods. Limited access to healthcare is
11
12 regarded as another form of structural violence.
13
14
15

16
17 A syndemics perspective helps to connect COVID-19 as "complex multi-system
18
19 clinical syndrome" to multimorbidity, polyiatrogenesis, and social deprivation. In the
20
21 next section, I will describe how people in a poor area of the UK experience
22
23 multimorbidity and polyiatrogenesis, pointing to an as yet little explored syndemic
24
25 pattern and also to possible ways we might rethink social vulnerability to SARS-CoV-2.
26
27
28
29
30
31
32

33 **Overtreating the underprivileged**

34

35
36 My research took place in one of the UK's most deprived areas, which I will call
37
38 Greyfield. Similar to the pattern described by Mendenhall (2012; 2016), Greyfielders
39
40 experience clusters of structural violence, depression, diabetes, and abuse. However,
41
42 they were not immigrants and they had universal access to healthcare, provided free of
43
44 charge by the National Health Service (NHS). Thus, even the poorest are frequently on
45
46 multiple medications without any financial burdens on households.
47
48
49
50

51
52 The population of Greyfield is largely white British. Most of the housing is made up
53
54 of apartments in tower blocks and low-rises built in the 1960s and 1970s. The area saw
55
56
57
58
59
60

1
2
3 substantial redevelopments in the 1990s and 2000s. Despite some improvements,
4
5
6 Greyfield still has some of the UK's worst scores for health, income, employment,
7
8
9 education, and crime. Life expectancy of area residents is shockingly low at only 61 years
10
11 on average, which is *20 years shorter* than the average UK life expectancy. Greyfield's life
12
13
14 expectancy is below that of Zimbabwe.
15

16
17 One of the infrastructural improvements to Greyfield since the 2000s was the
18
19 construction of Greyfield Care Centre (GCC), a joint facility of the NHS and the local
20
21 council. GCC tries to take a more integrated approach by combining different medical
22
23 specializations (primary care, cancer support, dentistry, midwifery) with social services.
24
25
26 GCC also houses a clinic for Lifestyle, Nutrition, and Complementary Therapy (LNC).
27
28
29 My fieldwork was conducted in the LNC section of GCC. I analyzed 80 case files,
30
31
32 discussed 30 selected cases with therapists, and shadowed 40 consultations. Most of the
33
34
35 patients get referred to LNC by GPs in GCC. The patients that the LNC practitioners see
36
37
38 are the same as those treated by the GPs, but LNC consultations allow far more time for
39
40
41 patients to talk about their lives, their diets, and their medication regimes. LNC's hour-
42
43
44 long, open-ended consultations allowed patients' to explore complex problem in much
45
46
47 greater depth than in the GP consultations, where patients were given no more than five
48
49
50 or ten minutes. The average length of GP consultations in the NHS—nine minutes--is
51
52
53 one of the lowest among OECD countries (Wardle 2019). In the NHS, patients' time with
54
55
56 GPs is extremely rationed, and longer consultations with a doctor are unavailable.
57
58
59
60

1
2
3 In LNC, Greyfield patients presented with a wide range of problems, but a few
4
5
6 constellations came up repeatedly. Five or more co-occurring problems was the norm.
7
8 The majority had mental problems along with physical problems. Traumatic life events
9
10 were common. Chronically difficult social circumstances were nearly always present.
11
12
13 Among various physical complaints, digestive diseases were virtually always present.
14
15
16 Obesity was very common and was usually coupled with diabetes. Hypertension was
17
18
19 pervasive. Physical problems appeared together with mental problems. Depression and
20
21
22 anxiety were the most common mental illnesses.
23

24
25 Both mental and physical problems were often related to life trauma. Many traumatic
26
27 events happened in relation to family members. Domestic violence and emotional abuse
28
29 in intimate partnerships were common. Loss of family members, often at a young age,
30
31
32 was another frequent source of trauma in this population. Miscarriages were also
33
34
35 common. Haunting memories of losses suffered were a recurrent problem. Susan, a
36
37
38 woman in her early 50s, for instance, first came to LNC because she wanted to lose
39
40
41 weight and sleep better. In the first consultation, she broke down in tears. The sleep
42
43
44 disturbance had started the previous year, when her brother died and one of her
45
46
47 surgeries went wrong. She said her family was "broken": mother, father, cousins, uncles
48
49
50 had all died, and her twin sister died when she was still a child. She said she often wakes
51
52
53 up at night in a panic, as if a bright light was shining into her eyes.
54
55
56
57
58
59
60

1
2
3 Substance use was mentioned often by patients. Mostly, this referred to alcohol (for
4 patients of all ages) and cannabis (among younger patients). Feeling "empty" or "bored"
5
6 were patients' explanations for why substances were used. Strong food aversions were
7
8
9 were patients' explanations for why substances were used. Strong food aversions were
10
11 also common. For example, Jack, a patient in his late 30s, complained about depression,
12
13 panic attacks, acid reflux, sleep disturbance, and headaches. He also suffered from
14
15 severe back pain, which two previous surgeries failed to make better. He traced his
16
17 problems to his childhood: he was always disgusted by eating meat, but his parents
18
19 forced it down his throat. In his experience, he said, the best remedy against the pain and
20
21 the panic is smoking cannabis. Patients like Susan and Jack presented with complex
22
23 multimorbidity in ways that are probably similar to many clinics in the world where a
24
25 combination of poor diet, precarity, and multiple social traumas coalesce to cause or
26
27 augment physical suffering. Patients like Susan and Jack presented with complex
28
29 multimorbidity in ways that are probably similar to many clinics in the world where a
30
31 combination of poor diet, precarity, and multiple social traumas coalesce to cause or
32
33 augment physical suffering.

34
35
36 Despite the common presentation of patients at Greyfield, and despite the ample
37
38 access to care they were provided, their overall state of health seemed often worsened by
39
40 uncoordinated treatments. Molly's experience exemplifies this vividly. Molly was a 37-
41
42 year-old woman born and raised in Greyfield. Molly came to LNC for a persistent pain
43
44 in her foot. In the first consultation with Heather, the LNC practitioner, Molly added
45
46 that she was also suffering from diabetes type II, that she wanted to lose weight, and that
47
48 she could help with her irritable bowel syndrome (IBS). Molly was aware of the main
49
50 food triggers for her IBS but she could not keep it in check. Molly said that her job as a
51
52
53
54
55
56
57
58
59
60

1
2
3 care worker was very stressful, especially when working late hours. She said her stress
4
5
6 "gets to my stomach." Her bowel movements were very irregular. The first time she was
7
8
9 diagnosed with IBS was when she was a child. She got some treatment and the problem
10
11 was not too troubling until five years ago when she had a protracted and difficult
12
13
14 breakup with her husband, during which she and her son suffered domestic abuse. That
15
16
17 led, in turn, to lots of "behavioral problems" in her son that she was still struggling with.
18
19
20 Asked by Heather if she had time left to look after herself, Molly said "my self-care is
21
22 really bad, I know that it is really bad."
23

24
25 Molly took a dose of Imodium every morning and had become completely
26
27 dependent on it. Imodium (loperamide) is a common over-the-counter drug for acute
28
29 diarrhea. The medication slows down the digestive process and should not be used for
30
31 more than 48 hours. Molly complained about her daily eating habits, especially too
32
33 many potato chips: "Pringles are my downfall." Molly drank three to four litres of Coca-
34
35 Cola throughout the day: "I am really bad with fizzy drinks." Asked if the GPs had
36
37 explained the links between diabetes, blood sugar and high-sugar drinks, Molly said that
38
39 the doctors did not yet have time to talk about food. Instead, they were "just firing
40
41 tablets at me." She had not been told by anyone face-to-face how to manage her diabetes.
42
43
44 The LNC practitioner asked about Molly's blood sugar readings, but Molly replied that
45
46 she had no idea. Heather fetched a blood sugar kit and administered a test, by pricking
47
48 one of Molly's fingers and putting the blood in a glucose monitor. The reading showed
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 an extremely high glucose level of 17 mmol/L. Heather asked what medications Molly is
4
5 on. Molly pulled a black rubbish bag out of her handbag and put it on the table: "my
6
7 lucky bag of medicines," she laughed. Molly said that she is taking two medformin (a
8
9 standard tablet for diabetes) every morning, plus another diabetes medication. Heather
10
11 said that Molly should find out how to monitor her blood sugar levels, not least because
12
13 her levels are high *despite* already being on drugs.
14
15
16
17
18

19 Molly unpacked seven other drugs from her "lucky" bag: an antidepressant
20
21 (citalopram 20mg), propranolol (a beta-blocker, against the anxiety of having diarrhea
22
23 while out of the house); Fianola, a contraceptive; an antihistamine for allergies;
24
25 omeprazole against gastric reflux; gentamicin, an antibiotic drug; and a high-dose
26
27 ibuprofen for the pain in the foot. Molly continued to unpack a number of alternative
28
29 remedies, including sage pills and matcha green tea pills, which were meant to help her
30
31 against "hot flashes." She said that she is a "hot person," "burning up very quickly," and
32
33 joked that she should "move to Iceland" to feel more comfortable.
34
35
36
37
38
39
40

41 Heather asked about Molly's body weight. She said she weighs about 20 stone. At her
42
43 body height, her BMI was 45, putting her into the obese category. Molly said she has
44
45 always been "big." She then asked about a growth on her foot and showed it to Heather.
46
47 A GP had told her it was a "ganglion." It caused her much pain and restricted her
48
49 movement. By overcompensating with her other foot, she developed plantar fasciitis and
50
51 dislocated a bone. She had phoned her GP about the ganglion but was told that there
52
53
54
55
56
57
58
59
60

1
2
3 was nothing else they could do. Heather probes further about what kind of pain Molly
4
5 has in her foot and is told it is like “pins and needles,” which Heather said might be
6
7 related to the diabetes. Molly further said that she has not been told by any doctor what
8
9 she could do about the plantar fasciitis. Drawing the consultation to a close, Heather said
10
11 she does not want to prescribe any therapy yet. Instead, Molly should come back for a
12
13 full assessment and then they would work out a care plan. Molly thanked Heather for
14
15 taking so much time, saying that GPs only ever spoke to her briefly and only about a
16
17 specific ailment. Heather went on to add that Molly should stop drinking fizzy drinks
18
19 immediately. Molly asked if juices or fizzy water would be alright to have instead, but
20
21 Heather told her that neither of them would be good for her, both for the sugar and for
22
23 the fizz.
24
25
26
27
28
29
30
31
32

33 Molly’s case gives an insight into the “invisible epidemic” (Mangin and
34
35 Garfinkel 2019) of patients with multiple health problems receiving multiple poorly
36
37 integrated treatments that cause too often cause more harm than good. My point is not
38
39 that Molly’s case is exceptional but rather that it is not exceptional at all. In fact, the
40
41 cluster of multiple comorbidities experienced by Molly could be said to appear in
42
43 syndemic form in many poor pockets of rich nations around the world. These pockets
44
45 reveal high levels of multimorbidity and polyiatrogenesis. What I am suggesting is that
46
47 such areas of social deprivation and overmedication might be at a substantially higher
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 risk from a virus that becomes particularly dangerous for people with multiple chronic
4
5
6 conditions.

7
8 Molly's overflowing bag of medicines is an example of how multimorbidity is
9
10 deepened by the use of too many pharmaceuticals. I am not arguing that any single one
11
12 of the GPs' treatments is irrational. What I am arguing is that a vertical system does not
13
14 give physicians enough time to control for potentially iatrogenic effects, especially in
15
16 chronic patients. When multiple single-target medications are coupled with a lack of
17
18 explaining what is going on, the risks of overtreated ills become even greater. In an era
19
20 of rising multimorbidity, biomedical specificity becomes part of a new kind of
21
22 pathology.
23
24
25
26
27
28
29

30 What is so striking about multimorbid patients in the UK is that their poor health
31
32 cannot be attributed to a biomedical treatment gap, in the way that this might be done in
33
34 Mendenhall's (2012) study on syndemics and structural violence in the US. The UK
35
36 situation also differs from places like Brazil where poverty is heavily pharmaceuticalized
37
38 (e.g., Scheper-Hughes 1992; Biehl 2005; Béhague 2015). In the UK, GPs are basically too
39
40 short of time to treat complex patients in complex ways. They throw a pill at any ill in
41
42 the belief that this constitutes good care while being unable to deal with the underlying
43
44 problems and while losing sight of iatrogenesis. Greyfielders are deprived
45
46 socioeconomically, but this deprivation does not translate into a lack of healthcare. The
47
48 problem is a lack of integrated care.
49
50
51
52
53
54
55
56
57
58
59
60

Pharmaceuticalized pockets within richer regions

It is still early to know the links between multimorbidity, polyiatrogenesis, and COVID-19. As mentioned, there is not a single medical study yet on links between COVID-19 fatalities and multiple chronic medication uses. No one is tracking systematically what kind of medications COVID-19 victims are consuming when they get into hospitals with severe symptoms, let alone how chronic medication regimes interact with COVID-19 in the community setting.

Even without this clinical evidence, it is possible to look for patterns on a population level. In the UK clinic I studied, high levels of multimorbidity and polyiatrogenesis were evident. If the hypothesis of chronic polypharmacy as a risk factor for COVID-19 holds, we would see higher rates of COVID-19 deaths in countries with high rates of multimorbidity, social inequality, ready access to biomedicine, and pronounced verticality in service delivery. What I found through ethnographic work in a UK clinic would lead to expect that death rates are indeed higher in the UK than in countries where this syndemic pattern is not as pronounced.

The global epidemiology of COVID-19 is still in flux, and many puzzles still have no convincing solution. Nevertheless, some epidemiological patterns have crystallized and remain fairly stable. First, we now know that the UK had become one of the world's hardest-hit countries by May 2020. While it is still difficult to draw meaningful

1
2
3 comparisons between countries, there is solid evidence that the UK was exceptionally
4
5 affected by the pandemic. By August 2020, the UK had one of the world's highest
6
7 COVID-19 death rates, both by absolute numbers of victims (more than 50,000) and by
8
9 fatalities per million population (685 compared to 94 in the world) (*Our World in Data*
10
11 2020). The UK started to record "extremely high" excess death rates from week 13
12
13 onward (EuroMOMO 2020). While most other European countries saw their excess
14
15 death rates return to normal levels over the next three weeks, and while other nations
16
17 saw their case fatality rate decline as more people tested positive without deadly
18
19 outcomes, the UK continued to record "extremely high" excess rates for another eight
20
21 weeks. Even the UK's nation-wide lockdown took two months to bring a significant
22
23 reduction in death rates. In June, a full twelve weeks into lockdown, the UK recorded
24
25 daily death rates higher than all other EU countries *combined*. The UK has done worse
26
27 than most countries in the world, including the US. There were abject errors in the UK
28
29 government's COVID-19 response (Horton 2020), but these policy failures cannot explain
30
31 the UK's exceptionally high death toll.
32
33
34
35
36
37
38
39
40
41
42
43

44 Studies on European death rates consistently found correlations between social
45
46 deprivation and dying with the virus: "COVID-19 is painfully exposing the existing and
47
48 persisting health inequalities in our societies. This pandemic will have the heaviest
49
50 impact on the lives of people living in deprivation or facing difficult socio-economic
51
52 circumstances" (EuroHealthNet 2020). The UK showed the same pattern. Across
53
54
55
56
57
58
59
60

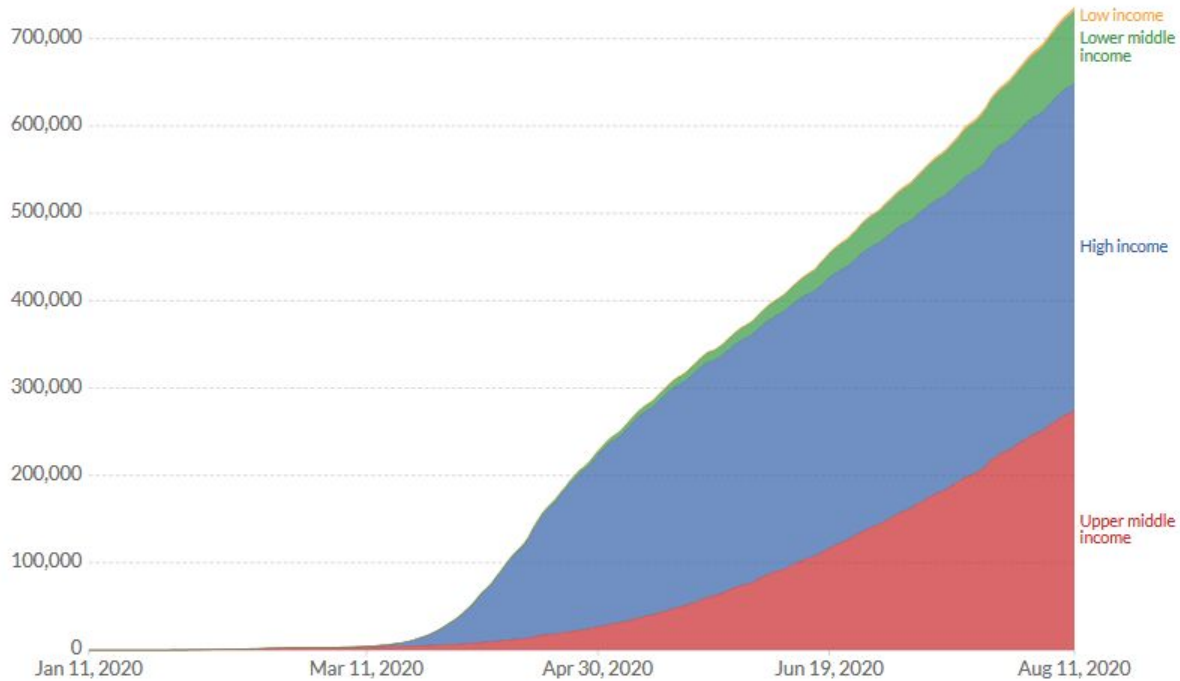
1
2
3 England, Wales, and Scotland, death rates were more than twice as high in
4
5 socioeconomically deprived areas than in other areas. People in low-paid employment
6
7 were dying at much higher rates than those in white-collar employment (New Statesman
8
9 2020). Socioeconomic inequality is one of the strongest predictors for dying with COVID-
10
11 19 (Clark & Whiteley 2020).
12
13
14
15

16
17 In the UK, as in practically all the European countries, social inequality does not
18
19 translate into unequal access to biomedical care. In Greyfield and elsewhere in the UK,
20
21 relative poverty does not mean less access. But no amount of clinical care can shield
22
23 from dying with COVID-19. Docherty and colleagues' (2020) study on hospital outcomes
24
25 in the UK found that the death rate of all patients admitted was 33%. In ICU units, 45%
26
27 died. The UK is not an outlier in poor outcomes of hospital care. Reflecting on her
28
29 gruelling experiences of giving intensive care to COVID-19 patients in New York City
30
31 hospitals, Dr. Helen Ouyang (2020) realized that all the biomedical care in the world was
32
33 unable to save people's lives: "What I think will actually cause moral injury is seeing
34
35 people die after getting the most advanced care available. People who come in talking,
36
37 with stories to share. They get care—the best that modern medicine has to offer—with
38
39 life-prolonging machines and IV drips of all sorts of critical-care drugs. We put our full
40
41 minds and whole hearts into trying to save them. Then I see their bodies shut down
42
43 anyway." Even the best-equipped healthcare system offers no good defense against
44
45 COVID-19.
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 Compared to other infectious diseases, COVID-19 behaves in an utterly surprising
4 way. All other major infectious diseases—tuberculosis, HIV, or malaria—show a strong
5 correlation between low GDP and high death rates. SARS-CoV-2 inverts this pattern
6 on: so far, the impact of the virus was far more severe in rich countries than in low-
7 income countries. To be sure, the pandemic is still unfolding and what the situation
8 might be in the long run is not known. And yet, to date high GDP and high COVID-19
9 death rates are strongly correlated. By mid-August 2020, upper-middle and high-income
10 countries suffered 90% of all COVID-19 deaths, despite having about half the world's
11 population. This pattern is so strange because infectious diseases usually strike much
12 harder in poorer countries.
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Total confirmed COVID-19 deaths

Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



Source: European CDC - Situation Update Worldwide - Last updated 11 August, 12:03 (London time)

OurWorldInData.org/coronavirus • CC BY

Relative CHART TABLE SOURCES DOWNLOAD

Until July 2020, all the world's countries with the highest per million population death rates lay in a corridor stretching from Northwest to Southwest Europe. Sweden, a country famous for not implementing a lockdown, only joined this group in the last days of May. Death rates per million population of 500 or more outside these European countries have so far only been reached in the US, Chile, and Peru, and that only since July. Viral infections usually take advantage of "multiple co-infections and biological and social vulnerabilities in a world where syndemics disproportionately affect marginalized

1
2
3 and less-resourced communities" (Manderson & Wahlberg 2020: 2). That means,
4
5 practically without exception, that infectious diseases are far worse in poorer countries
6
7 than in richer countries. COVID-19 turns this pattern on its head: all the hardest-hit
8
9 countries are GDP-rich countries. COVID-19 does not seem to strike most where levels
10
11 of absolute poverty are high, instead it hits the rich countries. There were some outliers,
12
13 notably East Asian countries did far better than what their GDP per capita would lead to
14
15 expect. The overall trend is clear, however. The world map of COVID-19 mortality does
16
17 not show any Global North/South distributions along poor access to quality healthcare.
18
19 Instead, the COVID-19 map looks like an atlas of rich industrialized countries with
20
21 excellent clinical care. To be sure, GDP is a poor proxy for ease of access to biomedical
22
23 treatments—US healthcare is a case in point. At the very least it safe to say that high
24
25 income and excellent biomedical care do not protect against high COVID-19 death rates.
26
27
28
29
30
31
32
33
34

35
36 The country-to-country comparison hides that *relative* deprivation within a wealthy
37
38 context is a key risk factor for health (Ecks 2021). COVID-19 strikes poorer pockets *within*
39
40 richer regions. Relatively deprived communities do not necessarily lack access to
41
42 biomedical care. These communities may have high levels of multimorbidity *within* a
43
44 context of relatively good healthcare access. Good access to healthcare clearly does not
45
46 protect anyone from dying with COVID-19. In fact, easy access may translate into
47
48 chronic overmedicalization, which in turn may make people more vulnerable to dying
49
50 with the virus infection. The UK data on double mortality rates in poorer areas confirm
51
52
53
54
55
56
57
58
59
60

1
2
3 this pattern. Other countries with stark regional and local wealth disparities exhibit this
4
5
6 pattern as well. Relative deprivation leads to higher rates of multimorbidity.
7

8
9 Multimorbidity increases the risk of polyiatrogenesis, especially where treatments are
10
11 accessible and affordable. It is possible that COVID-19 particularly affects multimorbid
12
13 patients who are prematurely sick because of deep wealth inequalities and whose
14
15 multimorbidity is exacerbated by polyiatrogenesis.
16
17

18
19 It is possible that there are other factors at work that explain why GDP-rich countries
20
21 have much higher death rates. Some of them are about GDP and global connectedness;
22
23 others are about GDP and population age structure. SARS-CoV-2 probably first made
24
25 impact along global air traffic routes, so that many poorer countries might have had a
26
27 delayed exposure to the virus. But date of exposure seems unrelated to eventual death
28
29 rates. Thailand, for example, was the first country outside China to record a SARS-CoV-2
30
31 infection, on January 13, 2020. The country has a population of 69 million. By August, it
32
33 had 58 deaths. The UK population is 66 million. The country recorded its first SARS-
34
35 CoV-2 case on 28 February 2020, seven weeks after Thailand. By August, the UK had
36
37 more than 50,000 deaths. Per one fatality in Thailand there were 862 fatalities in the UK.
38
39 Well into June 2020, the UK recorded five times more daily deaths than Thailand's *entire*
40
41 death count in a population larger than the UK's.
42
43
44
45
46
47
48
49
50

51
52 Many argue that richer countries, especially in North-Southwest Europe, became the
53
54 global epicenter of the pandemic because people there have longer life expectancies and,
55
56
57
58
59
60

1
2
3 therefore, higher rates of multimorbidity. But longer life expectancies alone cannot
4
5 explain any of these patterns. Among the Europeans, only Italians and Spaniards are in
6
7 the top ten globally. The UK ranks only 29th in the world for life expectancy. Japan, Hong
8
9 Kong and many other countries have much longer life expectancies than the UK, but are
10
11 not nearly as much hit by the pandemic. The same point can be made about a
12
13 population's median age as a protective factor against high COVID-19 death rates. That
14
15 low-income countries have younger populations and "therefore" have lower COVID-19
16
17 death rates is taken as an obvious fact (e.g., Pulla 2020). But if median age were a vital
18
19 factor, why would Peru have a COVID-19 death rate of 651 per million population at a
20
21 median age of just 27.5 years? At 46.3 years, Japan has the world's highest median age; at
22
23 8 deaths per million population, Japan also has one of the world's lowest COVID-19
24
25 death rates. Neither a country's life expectancy nor its median age seem to be decisive
26
27 factors in COVID-19 death rates.
28
29
30
31
32
33
34
35
36
37

38 To date, none of the available epidemiological and population data can confirm or
39
40 disconfirm links between high rates of chronic medication uses and COVID-19 death
41
42 rates. High GDP alone does not translate directly into high rates of pharmaceutical
43
44 consumption, fragmented care, or deeper wealth disparities within countries. But the
45
46 fact remains that the risk of dying with COVID-19 is not correlated with low income
47
48 levels, as practically all other infectious diseases are. Nor is it related to poor healthcare
49
50 access, as is the case with all other infectious diseases. Instead, epidemiology of COVID-
51
52
53
54
55
56
57
58
59
60

1
2
3 19 seems to confirm that countries with high rates of multimorbidity, high levels of
4
5
6 internal social inequality, and good health access are hardest hit.
7

8
9 Checking COVID-19 victims not just for underlying health conditions but also for
10
11 medication histories is the only way of knowing if there might be a link to chronic
12
13 multiple medication use. Much more research is needed to figure out how susceptibility
14
15 to dying with COVID-19 might be related to medication patterns. But to date, neither
16
17 clinicians, epidemiologists, nor social scientists are studying this. We need to link
18
19 COVID-19 deaths to clustered disorders and we need to link clustered disorders to
20
21 clustered overmedication. The short ethnographic case study I presented here is only a
22
23 tiny fragment in the work that needs to be done on experiences and causes of
24
25 multimorbidity, chronic medication use, and polyiatrogenesis in a pandemic era. Both
26
27 clinical and epidemiological findings are suggestive of links between relative
28
29 socioeconomic deprivation, medication overuse, and susceptibility to the novel
30
31 coronavirus. As long as there is no effective medication to treat COVID-19, clinicians
32
33 should make sure that existing treatments for other medical conditions are used with
34
35 greater care.
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53

54 **References**

55
56
57
58
59
60

1
2
3
4
5
6 Adams, Vincanne (Ed.)
7

8 2016 *Metrics: What Counts in Global Health*. Durham: Duke University Press.
9
10

11 Adams, Vincanne
12

13
14 2002 "Randomized Controlled Crime: Postcolonial Sciences in Alternative Medicine
15 Research." *Social Studies of Science* 32, no. 5-6: 659-690.
16
17
18

19 Aiden, Hardeep
20

21
22 2018 *Multimorbidity: Understanding the Challenge. A Report for the Richmond Group of*
23
24 *Charities*.
25

26
27 [https://richmondgroupofcharities.org.uk/sites/default/files/multimorbidity_-](https://richmondgroupofcharities.org.uk/sites/default/files/multimorbidity_-_understanding_the_challenge.pdf)
28
29 [_understanding_the_challenge.pdf](https://richmondgroupofcharities.org.uk/sites/default/files/multimorbidity_-_understanding_the_challenge.pdf)
30
31

32
33 American Heart Association
34

35 2020 Coronavirus Questions for Patients.
36

37
38 <https://www.heart.org/en/coronavirus/coronavirus-questions/if-youre-a-patient>
39
40
41 (accessed May 12, 2020)
42
43

44 Barnett, K., Mercer, S. W., Norbury, M., Watt, G., Wyke, S., & Guthrie, B.
45

46 2012 "Epidemiology of Multimorbidity and Implications for Health Care, Research, and
47
48 Medical Education: A Cross-sectional Study. *The Lancet*, 380, no. 9836: 37-43.
49
50

51 Béhague, D. P.
52
53
54
55
56
57
58
59
60

1
2
3 2015 "Taking pills for developmental ails in Southern Brazil: The biologization of
4
5
6 adolescence?" *Social Science & Medicine*, 143, 320-328.

7
8
9 Biehl, J.

10
11 2005 *Vita: Life in a zone of social abandonment*. Berkeley: University of California Press.

12
13
14 Busija, L., Lim, K., Szoeki, C., Sanders, K. M., & McCabe, M. P.

15
16
17 2019 "Do Replicable Profiles of Multimorbidity Exist? Systematic Review and Synthesis."
18
19 *European Journal of Epidemiology* 1-29.

20
21
22 Clark, H. & Whiteley, P.

23
24
25 2020 "Economic Inequality Can Help Predict COVID-19 Deaths in the US." London
26
27 School of Economics US Center Blog.
28
29 [https://blogs.lse.ac.uk/usappblog/2020/05/06/economic-inequality-can-help-predict-](https://blogs.lse.ac.uk/usappblog/2020/05/06/economic-inequality-can-help-predict-covid-19-deaths-in-the-us/)
30
31 [covid-19-deaths-in-the-us/](https://blogs.lse.ac.uk/usappblog/2020/05/06/economic-inequality-can-help-predict-covid-19-deaths-in-the-us/)

32
33
34
35
36 Day, M.

37
38 2020 Covid-19: Four fifths of Cases are Asymptomatic, China Figures Indicate. *British*
39
40 *Medical Journal* 2020;369:m1375.

41
42
43
44 Devlin, H.

45
46 2020 "Third of UK Covid-19 patients taken to hospital die, study finds." *The Guardian*, 29
47
48 April 2020.

49
50
51
52 Dugravot, A. et al.

53
54
55
56
57
58
59
60

1
2
3 2020 "Social Inequalities in Multimorbidity, Frailty, Disability, and Transitions to
4 Mortality: A 24-year Follow-up of the Whitehall II Cohort Study." *The Lancet Public*
5
6 *Health* 5, no. 1, e42-e50.
7
8

9
10
11 Dumit, J.

12
13
14 2012 *Drugs for Life: How Pharmaceutical Companies Define Our Health*. Durham: Duke
15
16 University Press.
17
18

19 Ecks, S.

20
21
22 2013 *Eating Drugs: Psychopharmaceutical Pluralism in India*. New York: New York
23
24 University Press.
25
26

27
28 2021 *Living Worth: Value and Values in Global Pharmaceutical Markets*. Durham: Duke
29
30 University Press.
31
32

33 EuroHealthNet

34
35 2020 What COVID-19 is teaching us about inequality and the sustainability of our health
36
37 systems. <https://eurohealthnet.eu/COVID-19>
38
39

40
41 EuroMOMO

42
43 2020 European Mortality Monitoring Project: Graphs and Maps.
44
45
46 <https://www.euromomo.eu/graphs-and-maps>.
47
48

49 Farmer, P.

50
51 1996 "On Suffering and Structural Violence: A View from Below." *Daedalus* 125, no. 1:
52
53 261-283.
54
55
56
57
58
59
60

1
2
3 Garin, N. et al.
4

5
6 2016 "Global Multimorbidity Patterns: A Cross-sectional, Population-based, Multi-
7
8 country Study." *Journal of Gerontology Series A Biological Sciences and Medical Sciences*
9
10
11 71, no. 2:205–14.
12

13
14 Guthrie, B. et al.
15

16
17 2012 "Adapting Clinical Guidelines to Take Account of Multimorbidity." *British Medical*
18
19 *Journal (Clin Res Ed)* 345: e6341.
20
21

22 Hanlon, P. et al.
23

24
25 2018 "Frailty and Pre-frailty in Middle-aged and Older Adults and Its Association with
26
27 Multimorbidity and Mortality: A Prospective Analysis of 493 737 UK Biobank
28
29 Participants." *Lancet Public Health* 3: e323–32.
30
31

32
33 Horton, R.
34

35
36 2020 Offline: COVID-19 and the NHS: "A National Scandal." *The Lancet*
37
38 395(10229):P1022.
39
40

41 Kaufman, S. R.
42

43
44 2015 *Ordinary Medicine: Extraordinary Treatments, Longer Lives, and Where to Draw the Line.*
45
46 Durham: Duke University Press.
47
48

49 Kleinman, A., Das, V., Lock, M., & Lock, M. M. (Eds.).
50

51
52 1997 *Social Suffering*. Berkeley: University of California Press.
53

54 Lawson, K. D. et al.
55
56
57
58
59
60

1
2
3 2013 "Double Trouble: The Impact of Multimorbidity and Deprivation on Preference-
4 weighted Health Related Quality of Life: A Cross-Sectional Analysis of the Scottish
5
6 Health Survey." *International journal for equity in health* 12, no. 1: 67.
7
8

9
10
11 Lock, M., & Nguyen, V. K.
12

13
14 2018 *An Anthropology of Biomedicine*. Oxford: John Wiley & Sons.
15
16

17 Mangin, D., & Garfinkel, D.
18

19 2019 "Foreword to the First Special Collection: Addressing the Invisible Iatrogenic
20 Epidemic: The Role of Deprescribing in Polypharmacy and Inappropriate
21 Medication Use." *Therapeutic Advances in Drug Safety* 10: 1-5.
22
23
24
25

26
27
28 Manderson, L. & Wahlberg, A.
29

30 2020 "Chronic Living in a Communicable World." *Medical Anthropology*. Preprint. DOI:
31
32 10.1080/01459740.2020.1761352
33
34

35
36 Maizes, V., Rakel, D., & Niemiec, C.
37

38 2009 Integrative medicine and patient-centered care. *Explore*, 5(5), 277-289.
39
40

41 Marini, J.J. and Gattinoni, L.
42

43
44 2020 Management of COVID-19 respiratory distress. *JAMA Insights*, April 24, 2020.
45
46 doi:[10.1001/jama.2020.6825](https://doi.org/10.1001/jama.2020.6825)
47
48

49 McQueenie, R., Foster, H., Jani, B.D., Katikireddi, S.V., Sattar, N., Pell, J.P., Ho, F.K.,
50
51 Niedzwiedz, C.L., Hastie, C.E., Anderson, J. and Mark, P.B.,
52
53
54
55
56
57
58
59
60

- 1
2
3 2020 "Multimorbidity, Polypharmacy, and COVID-19 infection within the UK Biobank
4 cohort." *medRxiv* [Preprint]
5
6
7
8
9 Mendenhall, E.
10
11 2012 *Syndemic Suffering: Social Distress, Depression, and Diabetes among Mexican Immigrant*
12 *Women*. Walnut Creek: Left Coast Press.
13
14
15
16 2016 "Beyond Comorbidity: A Critical Perspective of Syndemic Depression and Diabetes
17 in Cross-cultural Contexts." *Medical Anthropology Quarterly* 30, no. 4: 462-478.
18
19
20
21 2019 *Rethinking Diabetes: Entanglements with Trauma, Poverty, and HIV*. Cornell University
22 Press.
23
24
25
26
27 New Statesman
28
29
30 2020 "People from Scotland's most deprived areas twice as likely to die from Covid-19
31 than those in wealthiest areas." [https://www.newstatesman.com/2020/05/people-](https://www.newstatesman.com/2020/05/people-scotlands-most-deprived-areas-twice-likely-die-covid-19-those-wealthiest-areas)
32 [scotlands-most-deprived-areas-twice-likely-die-covid-19-those-wealthiest-areas](https://www.newstatesman.com/2020/05/people-scotlands-most-deprived-areas-twice-likely-die-covid-19-those-wealthiest-areas)
33
34
35
36
37
38 Nichter, M.
39
40
41 2016 "Comorbidity: Reconsidering the Unit of Analysis." *Medical Anthropology Quarterly*
42 30, no.4, 536-544.
43
44
45
46 Ouyang, H.
47
48
49 2020 "I'm an E.R. Doctor in New York. None of Us Will Ever Be the Same." *The New York*
50 *Times Magazine*, April 14, 2020.
51
52
53

54 The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team
55
56
57
58
59
60

1
2
3 2020 "The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus
4 Diseases (COVID-19) in China." *Chinese Journal of Epidemiology* 41: Epub ahead of
5
6 print. DOI:10.3760/cma.j.issn.0254-6450.2020.02.003
7
8
9

10
11 O'Brien, R. et al.
12

13
14 2011 "An 'Endless Struggle': A Qualitative Study of General Practitioners' and Practice
15 Nurses' Experiences of Managing Multimorbidity in Socio-economically Deprived
16 Areas of Scotland." *Chronic Illness* 7, no. 1: 45-59.
17
18
19
20

21
22 Our World in Data
23

24
25 2020 Statistics and Research: Coronavirus Pandemic
26
27 <https://ourworldindata.org/coronavirus#all-charts-preview> (last accessed August
28
29 13, 2020)
30
31

32
33 Patel, A. B., & Verma, A.
34

35
36 2020 COVID-19 and angiotensin-converting enzyme inhibitors and angiotensin receptor
37 blockers: what is the evidence? *JAMA* March 24, 2020.
38
39 <https://jamanetwork.com/journals/jama/article-abstract/2763803>.
40
41
42

43
44 Payne, Rupert A. et al.
45

46
47 2020 "Development and Validation of the Cambridge Multimorbidity Score." *Canadian*
48
49 *Medical Association Journal* February 03, 2020;192(5): E107-E114; DOI:
50
51 <https://doi.org/10.1503/cmaj.190757>
52
53

54
55 Pulla, Priyanka
56
57
58
59
60

1
2
3 2020 "'The epidemic is growing very rapidly': Indian government adviser fears
4 coronavirus crisis will worsen." *Nature*, 26 June 2020.

5
6
7
8
9 ([https://www.nature.com/articles/d41586-020-01865-](https://www.nature.com/articles/d41586-020-01865-w?fbclid=IwAR3g4Pbyp3N8sMzfXUBnK5IvOB5ftHydR8X2-9SADvwWwKgz1Xi57__vF9s)
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

w?fbclid=IwAR3g4Pbyp3N8sMzfXUBnK5IvOB5ftHydR8X2-
9SADvwWwKgz1Xi57__vF9s)

Richardson S, Hirsch JS, Narasimhan M, et al.

2020 "Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients
Hospitalized With COVID-19 in the New York City Area." *JAMA*. Published online
April 22, 2020.

Scheper-Hughes, N.

1992 *Death without weeping: The violence of everyday life in Brazil*. Berkeley: University of
California Press.

Schiøtz, M.L., Høst, D. & Frølich, A.

2016 "Involving Patients with Multimorbidity in Service Planning: Perspectives on
Continuity and Care Coordination." *Journal of Comorbidity* 6, no. 2: 95-102.

Singer, M., & C. Snipes

1992 "Generations of Suffering: Experiences of a Treatment Program for Substance
Abuse during Pregnancy." *Journal of Health Care for the Poor and Underserved* 3: 222–
234.

Singer, M., Bulled, N., Ostrach, B., & Mendenhall, E.

1
2
3 2017 "Syndemics and the Biosocial Conception of Health." *The Lancet* 389, no. 10072: 941-
4
5
6 950.

7
8
9 Stineman, M. G. et al.

10
11 2012 "All-cause 1-, 5-, and 10-year Mortality in Elderly People According to Activities of
12
13
14 Daily Living Stage." *Journal of the American Geriatrics Society* 60: 485–92.

15
16
17 van der Aa, M. J., van den Broeke, J. R., Stronks, K., & Plochg, T.

18
19 2017 "Patients with Multimorbidity and Their Experiences with the Healthcare Process:
20
21
22 A Scoping Review." *Journal of Comorbidity* 7, no. 1: 1-21.

23
24
25 Wardle, S.

26
27 2019 "Ten-minute appointments too short to be useful and must be phased out by 2030,
28
29
30 say GPs." *The Independent*, 21 May 2019.

31
32
33 [https://www.independent.co.uk/news/health/gp-appointments-ten-minutes-phase-](https://www.independent.co.uk/news/health/gp-appointments-ten-minutes-phase-out-2030-royal-college-nhs-a8922106.html)
34
35
36 [out-2030-royal-college-nhs-a8922106.html](https://www.independent.co.uk/news/health/gp-appointments-ten-minutes-phase-out-2030-royal-college-nhs-a8922106.html)

37
38
39 Weaver, L.J., Barrett, R. and Nichter, M.

40
41 2016 "Special Section on Comorbidity: Introduction." *Medical Anthropology Quarterly* 30,
42
43
44 no. 4: 435-441.

45
46
47 Wichmann, D., Sperhake, J. P., Lütgehetmann, M., et al.

48
49 2020 "Autopsy Findings and Venous Thromboembolism in Patients With COVID-19: A
50
51
52 Prospective Cohort Study." *Annals of Internal Medicine*, 6 May 2020.

53
54
55 <https://doi.org/10.7326/M20-2003>
56
57
58
59
60

1
2
3 Wunder, O.
4

5
6 2020. "Rechtsmediziner: "Ohne Vorerkrankung ist in Hamburg an Covid-19 noch keiner
7
8 gestorben." *Hamburger Morgenpost*, 6 May 2020.
9
10

11
12 White, K.
13

14
15 2006 *The Sage Dictionary of Health and Society*. London: Sage.
16
17

18
19 Whitty, C. J. M. et al.
20

21 2020 "Editorial: Rising to the Challenge of Multimorbidity." *The British Medical Journal*
22
23 368: 16964.
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60