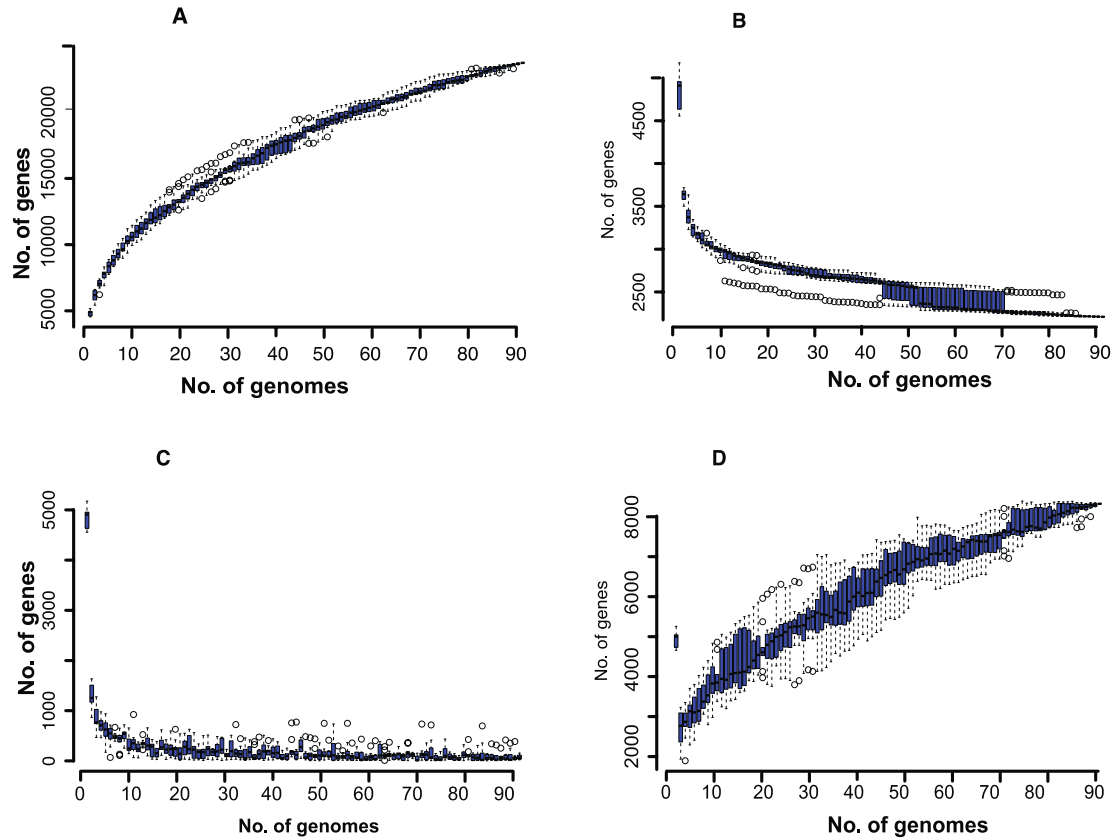
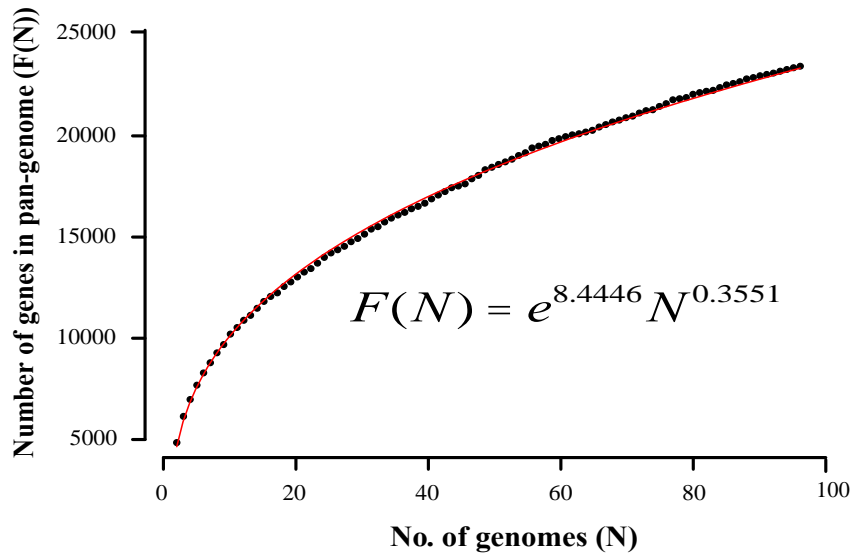


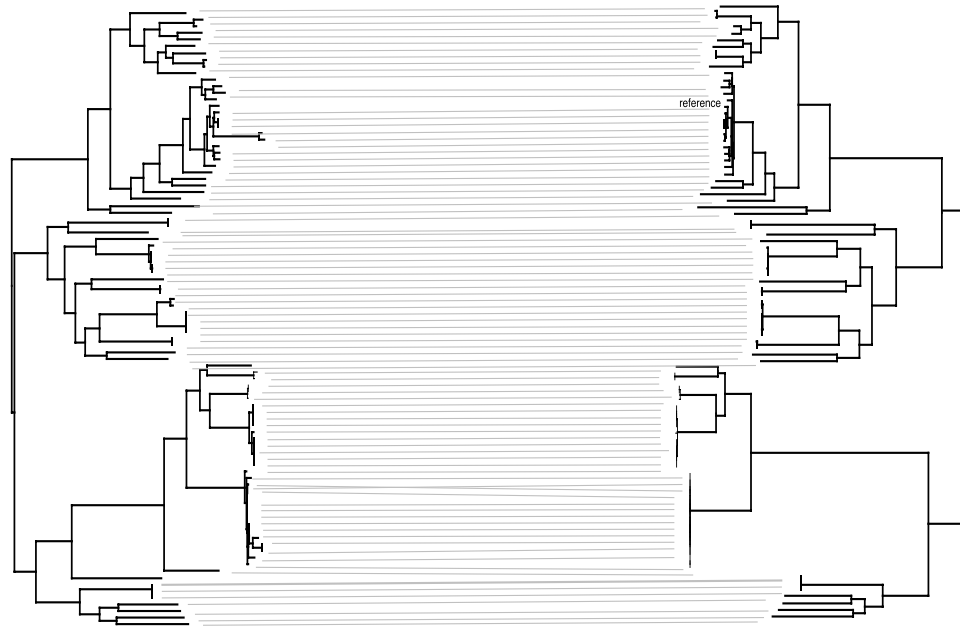
## Supplementary data



**Figure S1 Distributions of genes in the *E. coli* isolates collected from Blantyre, Malawi.** Box plots showing distribution of number of genes in 10 samples obtained iteratively for a given number of genome sequences. **(A)** Shows total number of single copy genes identified in the pan-genome of given set of *E. coli* genome sequences. **(B)** Shows total number of conserved (core) genes identified in at least 99% of a given set of genome sequences. **(C)** Shows number of 'new' genes identified per added genome sequence **(D)** Shows the number of genes unique genes i.e. identified in only one isolate as the number of *E. coli* isolates increased.



**Figure S2 Expansion of the pan-genome size with increasing number of genome sequences as modelled by the power law-regression equation  $F(N) = bN^\gamma$  illustrating an open pan-genome of the *E. coli* isolates.** By normalising the number of genes obtained in the 10 iterative samples per given set of genome sequences as described in Figure S1, the values of  $\beta$  and  $\gamma$  were estimated to obtain the power-law regression equation  $F(N) = e^{8.4446} N^{0.3551}$  depicted by the red line-graph. The points in black represent the average number of genes in the pan-genome of a given set of genomes.



**Figure S3 Tanglegram** comparing maximum likelihood (ML) phylogeny based on core genome alignment (right) with ML phylogeny based on whole genome sequence SNP alignment adjusted for recombination (left), revealing similar topology.

Table S1: European Nucleotide Accession Numbers and assembly statistics for sequenced isolates (RS=rectal swab).

| Strain ID | ENA AccessionID | Source | Country | Total Length | No. of contigs | Avg. Contig Length | N50    |
|-----------|-----------------|--------|---------|--------------|----------------|--------------------|--------|
| A39011    | ERS668966       | Blood  | Malawi  | 5273808      | 99             | 53270.79           | 205901 |
| 522_A     | ERS668975       | Blood  | Malawi  | 5461868      | 86             | 63510.09           | 205687 |
| A45214    | ERS668976       | Blood  | Malawi  | 5284968      | 96             | 55051.75           | 175071 |
| 1010805   | ERS668977       | Blood  | Malawi  | 5204957      | 176            | 29573.62           | 87988  |
| BHA15G    | ERS668978       | Blood  | Malawi  | 5290632      | 80             | 66132.9            | 313280 |
| BKQ7M8    | ERS668979       | Blood  | Malawi  | 5312488      | 123            | 43190.96           | 160639 |
| BKR1Z7    | ERS668980       | CSF    | Malawi  | 4903006      | 57             | 86017.65           | 235975 |
| D40034    | ERS668981       | Blood  | Malawi  | 5336252      | 102            | 52316.2            | 181853 |
| BKQ5JN    | ERS668982       | Blood  | Malawi  | 5380861      | 82             | 65620.26           | 177456 |
| A7898     | ERS668983       | Blood  | Malawi  | 5480078      | 181            | 30276.67           | 127272 |
| 3361      | ERS668984       | CSF    | Malawi  | 5503294      | 139            | 39592.04           | 280302 |
| D3787     | ERS668967       | Blood  | Malawi  | 5387283      | 162            | 33254.83           | 150578 |
| BKR406    | ERS668987       | CSF    | Malawi  | 5164557      | 168            | 30741.41           | 84814  |
| D3475     | ERS668988       | Blood  | Malawi  | 5283543      | 109            | 48472.87           | 126471 |
| B12381    | ERS668989       | CSF    | Malawi  | 5112808      | 125            | 40902.46           | 127923 |
| A7503     | ERS668990       | Blood  | Malawi  | 5326194      | 198            | 26899.97           | 156280 |
| C301      | ERS668991       | CSF    | Malawi  | 5015203      | 95             | 52791.61           | 147873 |
| A38084    | ERS668992       | Blood  | Malawi  | 5108748      | 104            | 49122.58           | 139415 |
| D3275     | ERS668993       | Blood  | Malawi  | 5270756      | 90             | 58563.96           | 180266 |
| A5175     | ERS668994       | Blood  | Malawi  | 5294462      | 132            | 40109.56           | 180364 |
| B1PG3     | ERS668968       | Blood  | Malawi  | 5172184      | 158            | 32735.34           | 87822  |
| D4531     | ERS668995       | Blood  | Malawi  | 4953068      | 114            | 43447.96           | 121138 |
| 2473      | ERS668996       | Blood  | Malawi  | 4919531      | 84             | 58565.85           | 210321 |
| D3420     | ERS668998       | Blood  | Malawi  | 5457019      | 156            | 34980.89           | 188255 |
| C10382    | ERS668999       | CSF    | Malawi  | 5319183      | 123            | 43245.39           | 131769 |
| 2228      | ERS669000       | CSF    | Malawi  | 5070388      | 155            | 32712.18           | 108237 |
| 10151     | ERS669001       | CSF    | Malawi  | 5350547      | 101            | 52975.71           | 189034 |
| 8728      | ERS669002       | CSF    | Malawi  | 4897747      | 147            | 33318.01           | 85461  |
| 10129     | ERS669004       | CSF    | Malawi  | 4951467      | 68             | 72815.69           | 261762 |
| A36329    | ERS669005       | Blood  | Malawi  | 5362879      | 106            | 50593.2            | 165106 |
| C1289     | ERS668969       | CSF    | Malawi  | 5276857      | 145            | 36392.12           | 221661 |
| B9070     | ERS669006       | CSF    | Malawi  | 4885674      | 104            | 46977.63           | 150391 |
| 9597      | ERS669007       | CSF    | Malawi  | 5094548      | 55             | 92628.15           | 206791 |
| D36115    | ERS669008       | Blood  | Malawi  | 5213958      | 122            | 42737.36           | 265285 |
| 2209      | ERS669009       | Blood  | Malawi  | 5289536      | 102            | 51858.2            | 184080 |

|         |           |       |        |         |     |          |        |
|---------|-----------|-------|--------|---------|-----|----------|--------|
| A25576  | ERS669010 | Blood | Malawi | 5428549 | 171 | 31745.9  | 129069 |
| D37334  | ERS669011 | Blood | Malawi | 5021537 | 200 | 25107.69 | 78986  |
| D25640  | ERS669012 | Blood | Malawi | 5282620 | 166 | 31823.01 | 143794 |
| D25641  | ERS669013 | Blood | Malawi | 5346456 | 94  | 56877.19 | 191459 |
| D29454  | ERS669014 | Blood | Malawi | 5113300 | 115 | 44463.48 | 183101 |
| A38988  | ERS669015 | Blood | Malawi | 5382272 | 208 | 25876.31 | 108438 |
| 1012184 | ERS668970 | Blood | Malawi | 4938419 | 95  | 51983.36 | 118104 |
| A40286  | ERS669016 | Blood | Malawi | 5587432 | 288 | 19400.81 | 93942  |
| 4464    | ERS669017 | CSF   | Malawi | 5179118 | 145 | 35718.06 | 109887 |
| B9222   | ERS669018 | CSF   | Malawi | 5063584 | 87  | 58202.11 | 240689 |
| C14036  | ERS669019 | CSF   | Malawi | 5244671 | 193 | 27174.46 | 87604  |
| A36140  | ERS669020 | Blood | Malawi | 5101616 | 100 | 51016.16 | 247618 |
| 3524    | ERS669021 | Blood | Malawi | 5170502 | 109 | 47435.8  | 190806 |
| 4600    | ERS669022 | Blood | Malawi | 5394345 | 107 | 50414.44 | 215073 |
| C12359  | ERS669024 | CSF   | Malawi | 5513173 | 206 | 26762.98 | 152004 |
| A32883  | ERS669025 | Blood | Malawi | 5301863 | 152 | 34880.68 | 164400 |
| BKQA8N  | ERS668971 | Blood | Malawi | 5609738 | 130 | 43151.83 | 182674 |
| 9693    | ERS669027 | Blood | Malawi | 5224453 | 159 | 32858.19 | 114505 |
| 2558    | ERS669028 | Blood | Malawi | 5213209 | 162 | 32180.3  | 141239 |
| A27     | ERS669029 | RS    | Malawi | 5334528 | 110 | 48495.71 | 175780 |
| C29     | ERS669031 | CSF   | Malawi | 5271826 | 90  | 58575.84 | 191186 |
| A333    | ERS669032 | Blood | Malawi | 4981825 | 100 | 49818.25 | 154051 |
| D39719  | ERS669033 | Blood | Malawi | 5163387 | 93  | 55520.29 | 226049 |
| C30     | ERS669034 | RS    | Malawi | 5185692 | 82  | 63240.15 | 201161 |
| C15     | ERS669035 | CSF   | Malawi | 5331258 | 129 | 41327.58 | 219011 |
| D40059A | ERS669036 | Blood | Malawi | 5341539 | 92  | 58060.21 | 155469 |
| BHAI AI | ERS668972 | Blood | Malawi | 4854690 | 92  | 52768.37 | 122489 |
| D43713  | ERS669037 | Blood | Malawi | 5341172 | 98  | 54501.76 | 162589 |
| C4      | ERS669039 | CSF   | Malawi | 5291658 | 126 | 41997.29 | 181330 |
| A16     | ERS669041 | RS    | Malawi | 5250580 | 132 | 39777.12 | 113555 |
| A35440  | ERS669042 | Blood | Malawi | 5153397 | 219 | 23531.49 | 65279  |
| C33B    | ERS669044 | CSF   | Malawi | 5303054 | 122 | 43467.66 | 122520 |
| D32322  | ERS669045 | Blood | Malawi | 5588592 | 119 | 46962.96 | 189956 |
| C14     | ERS669047 | CSF   | Malawi | 5329072 | 105 | 50753.07 | 166888 |
| D3871   | ERS669048 | Blood | Malawi | 5431645 | 159 | 34161.29 | 149291 |
| 1014142 | ERS669049 | Blood | Malawi | 5062819 | 120 | 42190.16 | 134448 |
| D29253  | ERS668973 | Blood | Malawi | 5440270 | 97  | 56085.26 | 203704 |
| B28     | ERS669050 | RS    | Malawi | 5404547 | 88  | 61415.31 | 192412 |
| C20b    | ERS669051 | RS    | Malawi | 5339050 | 147 | 36320.07 | 135868 |
| D49086  | ERS669052 | Blood | Malawi | 5431220 | 129 | 42102.48 | 160139 |
| D48799  | ERS669054 | Blood | Malawi | 5232386 | 83  | 63040.8  | 204504 |

|          |           |       |        |         |     |           |        |
|----------|-----------|-------|--------|---------|-----|-----------|--------|
| B3       | ERS669055 | RS    | Malawi | 4959972 | 100 | 49599.72  | 150867 |
| 1016948  | ERS668974 | CSF   | Malawi | 5155016 | 87  | 59253.06  | 244350 |
| BKQ79K_1 | ERS669067 | Blood | Malawi | 5020018 | 210 | 23904.85  | 78702  |
| 10276    | ERS669087 | Blood | Malawi | 5281674 | 105 | 50301.66  | 211874 |
| D26076   | ERS669089 | Blood | Malawi | 5477833 | 101 | 54235.97  | 170807 |
| A7881    | ERS669101 | Blood | Malawi | 5367711 | 123 | 43639.93  | 181395 |
| D45621   | ERS669107 | Blood | Malawi | 5206131 | 62  | 83969.85  | 326072 |
| D4275    | ERS669114 | Blood | Malawi | 5030609 | 50  | 100612.18 | 260601 |
| A44893   | ERS669128 | Blood | Malawi | 5219699 | 191 | 27328.27  | 106000 |
| A1a      | ERS669146 | RS    | Malawi | 5201081 | 167 | 31144.2   | 84058  |
| 10140    | ERS668997 | CSF   | Malawi | 5348508 | 100 | 53485.08  | 180964 |
| D42544   | ERS669030 | Blood | Malawi | 5556477 | 94  | 59111.46  | 188605 |
| D46760   | ERS669038 | Blood | Malawi | 5783150 | 192 | 30120.57  | 108336 |
| A48349   | ERS669040 | Blood | Malawi | 5361198 | 97  | 55270.08  | 175891 |
| A45016   | ERS669046 | Blood | Malawi | 4972999 | 78  | 63756.4   | 302059 |
| A3b      | ERS669056 | RS    | Malawi | 4937459 | 85  | 58087.75  | 143228 |
| D33237   | ERS669057 | Blood | Malawi | 4713852 | 282 | 16715.79  | 47506  |