

# THE LANCET HIV

## Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

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**Appendix. Supplementary Table 1. Diagnosis and procedure codes used in this study**

Outcome		ICD-9 codes	ICD-10 codes	Other codes
<b>Neural Tube Defects</b>		740.0, 740.1, 740.2, 742.0, 741.00, 741.01, 741.02, 741.03, 741.90, 741.91, 741.92, 741.93	Q00.0, Q00.1, Q00.2, Q01.0, Q01.1, Q01.2, Q01.8, Q01.9, Q05.0, Q05.1, Q05.2, Q05.3, Q05.4, Q05.5, Q05.6, Q05.7, Q05.8, Q05.9	
<b>Stillbirth</b>		651.31, 651.41, 651.51, 656.40, 656.41, 656.43, V27.1, V27.3, V27.4, V27.6, V27.7, V32.00, V32.01, V32.1, V32.2, V35.00, V35.01, V35.1, V35.2, V36.00, V36.01, V36.1	O36.4XX0, O36.4XX1, O36.4XX2, O36.4XX3, O36.4XX4, O36.4XX5, O36.4XX9, P95, Z37.1, Z37.3, Z37.4, Z37.6, Z37.60, Z37.61, Z37.62, Z37.63, Z37.64, Z37.69, Z37.7	CPT: 88016
<b>Pregnancy Loss</b>	<b>Spontaneous Abortion</b>	632, 634.00, 634.01, 634.02, 634.10, 634.11, 634.12, 634.20, 634.21, 634.22, 634.30, 634.31, 634.32, 634.40, 634.41, 634.42, 634.50, 634.51, 634.52, 634.60, 634.61, 634.62, 634.70, 634.71, 634.72, 634.80, 634.81, 634.82, 634.90, 634.91, 634.92, 651.33, 651.61, 651.63	O02.1, O03.0, O03.1, O03.2, O03.30, O03.31, O03.32, O03.33, O03.34, O03.37, O03.39, O03.4, O03.5, O03.6, O03.7, O03.80, O03.81, O03.82, O03.83, O03.84, O03.85, O03.86, O03.87, O03.88, O03.89, O03.9	CPT: 59812, 59820, 59821, 59830  DRG: 779
	<b>Induced Abortion</b>	635.00, 635.01, 635.02, 635.10, 635.11, 635.12, 635.20, 635.21, 635.22, 635.30, 635.31, 635.32, 635.40, 635.41, 635.42, 635.50, 635.51, 635.52, 635.60, 635.61, 635.62, 635.70, 635.71, 635.72, 635.80, 635.81, 635.82, 635.90, 635.91, 635.92, 636.00, 636.01, 636.02, 636.10, 636.11, 636.12, 636.20, 636.21, 636.22, 636.30, 636.31, 636.32, 636.40, 636.41, 636.42, 636.50, 636.51, 636.52, 636.60, 636.61, 636.62, 636.70, 636.71, 636.72, 636.80, 636.81, 636.82, 636.90, 636.91, 636.92, 637.00, 637.01, 637.02, 637.10, 637.11, 637.12, 637.20, 637.21, 637.22, 637.30, 637.31, 637.32, 637.40, 637.41, 637.42, 637.50, 637.51, 637.52, 637.60, 637.61, 637.62, 637.70, 637.71, 637.72, 637.80, 637.81, 637.82, 637.90, 637.91, 637.92, 638.0, 638.1, 638.2, 638.3, 638.4, 638.5, 638.7, 638.8, 638.9	O04.5, O04.6, O04.7, O04.80, O04.81, O04.82, O04.83, O04.84, O04.85, O04.86, O04.87, O04.88, O04.89, O07.0, O07.1, O07.30, O07.31, O07.32, O07.33, O07.34, O07.35, O07.36, O07.37, O07.38, O07.39, O07.4, Z33.2	CPT: 59840, 59841, 59850, 59851, 59852, 59855, 59856, 59857  DRG: 770  HCPCS: S0199, S2260, S2262, S2265, S2266, S2267  ICD-9-PCS: 75.0, 69.01, 69.51, 74.91  ICD-10-PCS: 10A00ZZ, 10A03ZZ, 10A04ZZ, 10A07Z6, 10A07ZW, 10A07ZX, 10A07ZZ, 10A08ZZ

<b>HIV</b>	042, 795.3, V08	B20, B9735, O98.7, O98.71, O98.711, O98.712, O98.713, O98.719, O98.72, O98.73, Z21
<b>Exposure</b>	<b>National Drug Code (NDC)</b>	
<b>Dolutegravir</b>	49702022813, 54569641900, 49702023113, 54569656900, 54569641901, 49702022613, 49702022713, 49702024213, 50090160600, 49702024613, 49702025537	
<b>Other Antiretrovirals</b>	00003196401, 00003196501, 00003196601, 00003196701, 00003196801, 00004024515, 00006057143, 00006057318, 00006057340, 00006057342, 00006057354, 00006057362, 00054464725, 00056047030, 00056047330, 00056047492, 00074194063, 00074395646, 00074395977, 00074663322, 00074949202, 00081011318, 00087663241, 00087663341, 00087665201, 00087667117, 00087667217, 00087667317, 00087667417, 00173010855, 00173011318, 00173047001, 00173047100, 00173050100, 00173059500, 00173059502, 00173066100, 00173066101, 00173066400, 00173069100, 00597004601, 00597004660, 00597004724, 52959050804, 52959050860, 52959050930, 52959054606, 52959054628, 54569422101, 54569433300, 54569433400, 54569452400, 54569452401, 54569454303, 54569456100, 54569461100, 54569479200, 54569488300, 54569519100, 54569533400, 54569862000, 54868369300, 55289038906, 55289039203, 61958040101, 63010001030, 63010002118, 00056051030, 54569537400, 54569539000, 00173071400, 00004038039, 54569550100, 54868378201, 54868466900, 54868378202, 00003362312, 00003362412, 00003363112, 61958060101, 49999006206, 54868485300, 54868485400, 54868378203, 55289038920, 54569552100, 54868452200, 54868485700, 54569552500, 00173072100, 54569553000, 54569553200, 54868495400, 54569555000, 52959054614, 00173069120, 52959028930, 58016069090, 58016069860, 58016079500, 63010002770, 54868506100, 61958070101, 00173074200, 54868514100, 54569558800, 54569559400, 54569557300, 00555058801, 00555058901, 00555059001, 54569564300, 00004024451, 00074663330, 54569565600, 54569566400, 00597000302, 00054005221, 63304092060, 65862002460, 65862004824, 00074679922, 61958060201, 54569575200, 68258900301, 68258914201, 16590006106, 16590006460, 54569578100, 54868556600, 55045348103, 54868560000, 54868466800, 55289094712, 65862010701, 59676056001, 15584010101, 54569580500, 00003362212, 00490702600, 54569586400, 23490708706, 49999006260, 00173072700, 54868369302, 54868452201, 00069080760, 00069080860, 00006022761, 00074052260, 67253010910, 35356006430, 35356006530, 35356006624, 35356006760, 35356006860, 35356006990, 35356007030, 35356007224, 35356007330, 35356007560, 54868564300, 00006057301, 54569603400, 54868580900, 54868583800, 59676057001, 35356006406, 35356007006, 35356007306, 35356010906, 35356011006, 35356011160, 35356011201, 35356011406, 35356011506, 35356011606, 35356011701, 54868586400, 35356006706, 35356007506, 35356011230, 35356013830, 59676056201, 54868011700, 35356010930, 35356011060, 35356011530, 35356011660, 35356020530, 35356020760, 35356020860, 35356020960, 31722050960, 35356011430, 35356028460, 35356028560, 66267050906, 00597000201, 59676056101, 54569610200, 65862031030, 65862031130, 65862031230, 65862031330, 54868596900, 31722051560, 31722051660, 31722051760, 31722051860, 00378504091, 00378504191, 00378504291, 00378504391, 67253096124, 59676056301, 65862004660, 65862004760, 65862011160, 65862011260, 52959096812, 52959096903, 67253076120, 21695036212, 21695036706, 21695084606, 59676056401, 54569608600, 00378610691, 59762119301, 67263026030, 67263043460, 67263059060, 54569614300, 59762365001, 54569615900, 00074333330, 54569617000, 66336056306, 00378888693, 00378888793, 00378888893, 00378888993, 66336003203, 49702020613, 49702020718, 49702020318, 49702020218, 49702020548, 68084046021, 68084046111, 68084046121, 68084046211, 68084046221, 49702020413, 49702022118, 54569620600, 59676057101, 49702021718, 49702020924, 49702020229, 49702021248, 49702021305, 49702022248, 00597004646, 49702021418, 16590006120, 49702021618, 49702021518, 49702022144, 54569571900, 54569621400, 00597012330, 59676027801, 49702021017, 54569617001, 54569623000, 54569623600, 49702022418,	

61958110101, 49702021120, 49702020853, 49702022318, 54569627000, 60505325106, 60505325203, 65862055330, 65862055260, 00093538506, 61958040401, 61958040301, 61958040501, 61958040601, 00004038140, 43063034606, 68084057821, 68084057811, 60429035360, 60429035430, 42799011301, 42799040401, 42799040301, 68258198803, 68258198106, 68258198006, 68258198903, 68258198206, 68258199003, 68258198303, 68258198406, 59676057201, 68258197903, 68258197706, 68258197103, 65862059760, 68180028407, 00054045058, 00054045921, 60505378806, 13925050060, 31722050560, 00378405091, 51991033106, 65862002760, 68258199406, 00378410591, 54569575201, 54569558802, 54569558803, 51079020401, 51079020406, 61958120101, 68071090806, 00006047761, 00006047361, 54569575202, 54569635200, 54569635100, 49702022517, 21695099660, 54868637000, 54868636900, 54868636800, 54868636000, 54868637100, 64376013302, 64376012923, 64376012801, 59676056630, 54569636600, 60429029860, 60505358306, 65862007360, 68084002111, 68084002121, 47781010060, 59676056501, 65162020906, 50436010101, 50436020601, 00597012990, 50436070101, 50436022401, 66336021406, 54569640300, 52343004560, 52343004401, 53217005206, 68180028607, 54569603401, 31722055760, 42291036360, 54569648401, 68084041621, 31722075360, 31722075430, 60505405803, 00527190506, 00006360360, 31722073960, 00378518091, 61958140101, 00781589331, 00378489093, 00003363810, 54838056670, 61958130101, 61958130201, 59676057530, 00003364111, 68180060207, 68180060306, 54569659400, 54569659500, 64380070703, 47781031730, 68084041695, 68084041625, 35356007003, 50268045915, 50268046013, 50268045911, 50268046011, 49702021301, 76282011560, 61958190101, 00378695077, 00006360301, 61442047060, 10135060571, 54569663300, 61958210101, 00378516991, 00378517093, 61958200201, 69097040302, 54569664500, 61958070501, 61958070301, 61958070401, 00904652304, 00904652306, 31722050660, 68788639403, 68788639408, 66993048230, 00093538256, 64380071703, 00527194748, 65862093290, 49702023508, 49702023308, 49702021326, 65862093330, 57237027424, 65862005524, 68180028806, 65862090030, 68071211306, 69097036202, 00904658304, 49702023755, 00006308001, 50742062430, 50742062360, 00378352091, 31722056224, 00093710456, 64980040709, 64980040603, 00093552706, 00093552856, 00093552606, 59762041003, 59762040906, 59762040806, 00006360361, 33342009607, 65862042130, 64380071404, 00378223393, 69097053302, 61958250101, 31722053530, 42291011530, 65862002630, 65862002560, 00054040713, 49502042593, 68382069606, 62064012202, 42385090103, 64980035406, 64980035706, 64980035506, 64980035606, 60505466603, 62064012201, 64980040524, 69097051403, 64380088904, 49502045093, 49502047593, 60687036425, 60687036211, 60687036221, 60687036495, 31722050430, 00074339930, 60687036695, 60687036625, 33342023807, 69097030102, 65862071330, 65862071160, 65862071260, 59676080030, 69097044503, 69097044403, 69097044602, 61919070602, 61919066902, 65862005724, 64380071104, 64380071003, 00006306901, 00006500701, 31722059730, 65862068730, 50090087002, 50090087000, 50090087003, 50090098000, 60687039995, 60687039925, 65162006106, 50090132700, 50090108502, 50090108501, 50090108500, 50090141900, 65862077430, 50090172400, 50090158100, 51293083268, 60687042025, 60687042095, 35573040230, 51407017330, 51407017160, 33342000309, 42291080030, 50090227900, 50090234000, 16714082001, 33342000409, 16714086001, 16714086201, 16714086101, 69076010503, 33342000109, 33342000207, 00904682104, 72606000201, 00904687404, 00904687406, 00904687504, 65862033530, 61958200202, 65862004930, 50268075812, 50268075811, 50268004912, 50268004911, 00074260521, 00074157521, 72865014460, 63304058360, 69238113803, 69238113606, 69238113706, 35573043030, 49702025018, 42385092931, 42385092830, 69097064202, 00093760756, 00093523456, 00121089720, 00121089715, 42543088904, 69238209403, 69238209303, 69238209203, 00093770456, 49702025315, 49702024015, 49702024813, 65862049730, 70710136703, 65862035430, 69097021002, 64380071904, 42543071904, 00378193093, 69238209503, 42385095330, 33342010607, 51407011230, 42291043930, 69097020902, 76282067830, 61958250103, 76282067730, 72865017230, 31722055612, 31722060360, 60219172206, 60219172107, 60505420203, 68180028706, 72189022702, 70710136503, 70710136603, 70710136403, 65862003660, 00904717207, 33342013807, 69097074102, 61958250501

ICD-9: International Classification of Diseases, 9<sup>th</sup> revision. ICD-9-PCS: International Classification of Diseases, 9<sup>th</sup> revision, procedure code. ICD-10: International Classification of Diseases, 10<sup>th</sup> revision. ICD-10-PCS: International Classification of Diseases, 10<sup>th</sup> revision, procedure code. CPT: Current Procedural Terminology Codes; DRG: Diagnosis-Related Group; HCPCS: Healthcare Common Procedure Coding System.

**Appendix. Supplementary Table 2. Diagnosis Codes of comorbidities used in this study**

Comorbidity	Diagnosis codes
Alcohol abuse	F1010, F10120, F10121, F10129, F10130, F10131, F10132, F10139, F1014, F10150, F10151, F10159, F10180, F10181, F10182, F10188, F1019, F1020, F10220, F10221, F10229, F10230, F10231, F10232, F10239, F1024, F10250, F10251, F10259, F1026, F1027, F10280, F10281, F10282, F10288, F1029, 30390, 30391, 30392, 30393, 30500, 30501, 30502, 30503, 76071
Asthma and COPD	J440, J441, J449, J4520, J4521, J4522, J4530, J4531, J4532, J4540, J4541, J4542, J4550, J4551, J4552, J45901, J45902, J45909, J45990, J45991, J45998, 4910, 4911, 4912, 49120, 49121, 49122, 4918, 4919, 4920, 4928, 49300, 49301, 49302, 49310, 49311, 49312, 49320, 49321, 49322
Immune System Disease	D800, D801, D802, D803, D804, D805, D806, D807, D808, D809, D810, D811, D812, D813, D8130, D8131, D8132, D8139, D814, D815, D816, D817, D81810, D81818, D81819, D8189, D819, D820, D821, D822, D823, D824, D828, D829, D830, D831, D832, D838, D839, D840, D841, D848, D84821, D84822, D8489, D849, D860, D861, D862, D863, D8681, D8682, D8683, D8684, D8685, D8686, D8687, D8689, D869, D890, D891, D892, D893, D8940, D8941, D8942, D8943, D8949, D8982, D8989, D899, M041, M042, M048, M049, M0500, M05011, M05012, M05019, M05021, M05022, M05029, M05031, M05032, M05039, M05041, M05042, M05049, M05051, M05052, M05059, M05061, M05062, M05069, M05071, M05072, M05079, M0509, M0510, M05111, M05112, M05119, M05121, M05122, M05129, M05131, M05132, M05139, M05141, M05142, M05149, M05151, M05152, M05159, M05161, M05162, M05169, M05171, M05172, M05179, M0519, M0520, M05211, M05212, M05219, M05221, M05222, M05229, M05231, M05232, M05239, M05241, M05242, M05249, M05251, M05252, M05259, M05261, M05262, M05269, M05271, M05272, M05279, M0529, M0530, M05311, M05312, M05319, M05321, M05322, M05329, M05331, M05332, M05339, M05341, M05342, M05349, M05351, M05352, M05359, M05361, M05362, M05369, M05371, M05372, M05379, M0539, M0540, M05411, M05412, M05419, M05421, M05422, M05429, M05431, M05432, M05439, M05441, M05442, M05449, M05451, M05452, M05459, M05461, M05462, M05469, M05471, M05472, M05479, M0549, M0550, M05511, M05512, M05519, M05521, M05522, M05529, M05531, M05532, M05539, M05541, M05542, M05549, M05551, M05552, M05559, M05561, M05562, M05569, M05571, M05572, M05579, M0559, M0560, M05611, M05612, M05619, M05621, M05622, M05629, M05631, M05632, M05639, M05641, M05642, M05649, M05651, M05652, M05659, M05661, M05662, M05669, M05671, M05672, M05679, M0569, M0570, M05711, M05712, M05719, M05721, M05722, M05729, M05731, M05732, M05739, M05741, M05742, M05749, M05751, M05752, M05759, M05761, M05762, M05769, M05771, M05772, M05779, M0579, M057A, M0580, M05811, M05812, M05819, M05821, M05822, M05829, M05831, M05832, M05839, M05841, M05842, M05849, M05851, M05852, M05859, M05861, M05862, M05869, M05871, M05872, M05879, M0589, M058A, M059, M0600, M06011, M06012, M06019, M06021, M06022, M06029, M06031, M06032, M06039, M06041, M06042, M06049, M06051, M06052, M06059, M06061, M06062, M06069, M06071, M06072, M06079, M0608, M0609, M060A, M061, M0620, M06211, M06212, M06219, M06221, M06222, M06229, M06231, M06232, M06239, M06241, M06242, M06249, M06251, M06252, M06259, M06261, M06262, M06269, M06271, M06272, M06279, M0628, M0629, M0630, M06311, M06312, M06319, M06321, M06322, M06329, M06331, M06332, M06339, M06341, M06342, M06349, M06351, M06352, M06359, M06361, M06362, M06369, M06371, M06372, M06379, M0638, M0639, M064, M0680, M06811, M06812, M06819, M06821, M06822, M06829, M06831, M06832, M06839, M06841, M06842, M06849, M06851, M06852, M06859, M06861, M06862, M06869, M06871, M06872, M06879, M0688, M0689, M068A, M069, M0800, M08011, M08012,

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Cardiovascular diseases	A3282, A3681, A381, A3950, A3951, A3952, A3953, B2682, B3320, B3321, B3322, B3323, B3324, B376, B5881, I00, I010, I011, I012, I018, I019, I020, I029, I050, I051, I052, I058, I059, I060, I061, I062, I068, I069, I070, I071, I072, I078, I079, I080, I081, I082, I083, I088, I089, I090, I091, I092, I0981, I0989, I099, I110, I130, I200, I201, I208, I209, I2101, I2102, I2109, I2111, I2119, I2121, I2129, I213, I214, I219, I21A1, I21A9, I220, I221, I222, I228, I229, I230, I231, I232, I233, I234, I235, I236, I237, I238, I240, I241, I248, I249, I2510, I25110, I25111, I25118, I25119, I252, I253, I2541, I255, I256, I25700, I25701, I25708, I25709, I25710, I25711, I25718, I25719, I25720, I25721, I25728, I25729, I25730, I25731, I25738, I25739, I25750, I25751, I25758, I25759, I25760, I25761, I25768, I25769, I25790, I25791, I25798, I25799, I25810, I25811, I25812, I2589, I259, I2602, I2609, I2692, I2693, I2694, I2699, I270, I271, I272, I2720, I2721, I2722, I2723, I2724, I2729, I2781, I2782, I2783, I2789, I279, I280, I281, I288, I289, I300, I301, I308, I309, I310, I311, I312, I313, I318, I319, I330, I339, I340, I341, I342, I348, I349, I350, I351, I352, I358, I359, I360, I361, I362, I368, I369, I370, I371, I372, I378, I379, I38, I400, I401, I408, I409, I420, I421, I422, I423, I424, I425, I426, I428, I429, I440, I441, I442, I4430, I4439, I444, I445, I4460, I4469, I447, I450, I4510, I4519, I452, I453, I454, I455, I456, I4581, I4589, I459, I469, I470, I471, I472, I479, I480, I481, I4811, I4819, I482, I4820, I4821, I483, I484, I4891, I4892, I4901, I4902, I491, I492, I493, I4940, I4949, I495, I498, I499, I501, I5020, I5021, I5022, I5023, I5030, I5031, I5032, I5033, I5040, I5041, I5042, I5043, I50810, I50811, I50812, I50813, I50814, I5082, I5083, I5084, I5089, I509, I510, I511, I512, I513, I514, I515, I517, I5181, I5189, I519, Z45010, Z45018, 03282, 03640, 03641, 03642, 03643, 07420, 07421, 07422, 07423, 11281, 11503, 11504, 11513, 11514, 11593, 11594, 1303, 34660, 34661, 34662, 34663, 3910, 3911, 3912, 3918, 3919, 3920, 393, 3940, 3941, 3942, 3949, 3950, 3951, 3952, 3959, 3960, 3961, 3962, 3963, 3968, 3969, 3970, 3971, 3979, 3980, 39890, 39891, 39899, 4100, 41000, 41001, 41002, 4101, 41010, 41011, 41012, 4102, 41020, 41021, 41022, 4103, 41030, 41031, 41032, 4104, 41040, 41041, 41042, 4105, 41050, 41051, 41052, 4106, 41060, 41061, 41062, 4107, 41070, 41071, 41072, 4108, 41080, 41081, 41082, 4109, 41090, 41091, 41092, 4110, 4111, 4118, 41181, 41189, 412, 4130, 4131, 4139, 4140, 41400, 41401, 41406, 41410, 41411, 41412, 41419, 4142, 4143, 4144, 4148, 4149, 4150, 4151, 41512, 41513, 41519, 4160, 4161, 4162, 4168, 4169, 4170, 4171, 4178, 4179, 4200, 42090, 42091, 42099, 4210, 4211, 4219, 4220, 42290, 42291, 42292, 42293, 42299, 4230, 4231, 4232, 4233, 4238, 4239, 4240, 4241, 4242, 4243, 42490, 42491, 42499, 4250, 4251, 42511, 42518, 4252, 4253, 4254, 4257, 4258, 4259, 4260, 42610, 42611, 42612, 42613, 4262, 4263, 4264, 42650, 42651, 42652, 42653, 42654, 4266, 4267, 42681, 42682, 42689, 4269, 4270, 4271, 4272, 42731, 42732, 42741, 42742, 4275, 42760, 42761, 42769, 42781, 42789, 4279, 4280, 4281, 42820, 42821, 42822, 42823, 42830, 42831, 42832, 42833, 42840, 42841, 42842, 42843, 4289, 4290, 4291, 4292, 4293, 4295, 4296, 42971, 42979, 42981, 42982, 42983, 42989, 4299, 430, 431, 4320, 4321, 4329, 43301, 43311, 43321, 43331, 43381, 43391, 4340, 43400, 43401,

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Diabetes	O24011, O24012, O24013, O24019, O2402, O2403, O24111, O24112, O24113, O24119, O2412, O2413, O24311, O24312, O24313, O24319, O2432, O2433, O24410, O24414, O24415, O24419, O24420, O24424, O24425, O24429, O24430, O24434, O24435, O24439, O24811, O24812, O24813, O24819, O2482, O2483, O24911, O24912, O24913, O24919, O2492, O2493, E08321, E08329, E08331, E08339, E08341, E08349, E08351, E08359, E1010, E1011, E1021, E1022, E1029, E10311, E10319, E10321, E103211, E103212, E103213, E103219, E10329, E103291, E103292, E103293, E103299, E10331, E103311, E103312, E103313, E103319, E10339, E103391, E103392, E103393, E103399, E10341, E103411, E103412, E103413, E103419, E10349, E103491, E103492, E103493, E103499, E10351, E103511, E103512, E103513, E103519, E103521, E103522, E103523, E103529, E103531, E103532, E103533, E103539, E103541, E103542, E103543, E103549, E103551, E103552, E103553, E103559, E10359, E103591, E103592, E103593, E103599, E1036, E1037X1, E1037X2, E1037X3, E1037X9, E1039, E1040, E1041, E1042, E1043, E1044, E1049, E1051, E1052, E1059, E10610, E10618, E10620, E10621, E10622, E10628, E10630, E10638, E10641, E10649, E1065, E1069, E108, E109, E1100, E1101, E1110, E1111, E1121, E1122, E1129, E11311, E11319, E11321, E113211, E113212, E113213, E113219, E11329, E113291, E113292, E113293, E113299, E11331, E113311, E113312, E113313, E113319, E11339, E113391, E113392, E113393, E113399, E11341, E113411, E113412, E113413, E113419, E11349, E113491, E113492, E113493, E113499, E11351, E113511, E113512, E113513, E113519, E113521, E113522, E113523, E113529, E113531, E113532, E113533, E113539, E113541, E113542, E113543, E113549, E113551, E113552, E113553, E113559, E11359, E113591, E113592, E113593, E113599, E1136, E1137X1, E1137X2, E1137X3, E1137X9, E1139, E1140, E1141, E1142, E1143, E1144, E1149, E1151, E1152, E1159, E11610, E11618, E11620, E11621, E11622, E11628, E11630, E11638, E11641, E11649, E1165, E1169, E118, E119, E1300, E1301, E1310, E1311, E1321, E1322, E1329, E13311, E13319, E13321, E133211, E133212, E133213, E133219, E13329, E133291, E133292, E133293, E133299, E13331, E133311, E133312, E133313, E133319, E13339, E133391, E133392, E133393, E133399, E13341, E133411, E133412, E133413, E133419, E13349, E133491, E133492, E133493, E133499, E13351, E133511, E133512, E133513, E133519, E133521, E133522, E133523, E133529, E133531, E133532, E133533, E133539, E133541, E133542, E133543, E133549, E133551, E133552, E133553, E133559, E13359, E133591, E133592, E133593, E133599, E1336, E1337X1, E1337X2, E1337X3, E1337X9, E1339, E1340, E1341, E1342, E1343, E1344, E1349, E1351, E1352, E1359, E13610, E13618, E13620, E13621, E13622, E13628, E13630, E13638, E13641, E13649, E1365, E1369, E138, E139, 24900, 24901, 24910, 24911, 24920, 24921, 24930, 24931, 24940, 24941, 24950, 24951, 24960, 24961, 24970, 24971, 24980, 24981, 24990, 24991, 25000, 25001, 25002, 25003, 25010, 25011, 25012, 25013, 25020, 25021, 25022, 25023, 25030, 25031, 25032, 25033, 25040, 25041, 25042, 25043, 25050, 25051, 25052, 25053, 25060, 25061, 25062, 25063, 25070, 25071, 25072, 25073, 25080, 25081, 25082, 25083, 25090, 25091, 25092, 25093, 64800, 64801, 64802, 64803, 64804
Epilepsy and seizures	G40001, G40009, G40011, G40019, G40101, G40109, G40111, G40119, G40201, G40209, G40211, G40219, G40301, G40309, G40311, G40319, G40401, G40409, G40411, G40419, G4042, G40501, G40509, G40801, G40802, G40803, G40804, G40811, G40812, G40813, G40814, G40821, G40822, G40823, G40824, G40833, G40834, G4089, G40901, G40909, G40911, G40919, G40A01, G40A09, G40A11, G40A19, G40B01, G40B09, G40B11, G40B19, R5600, R5601, R561, R569, 3450, 34500, 34501, 3451, 34510, 34511, 3452, 3453, 3454, 34540, 34541, 3455, 34550, 34551, 3456, 34560, 34561, 3457, 34570, 34571, 3458, 34580, 34581, 3459, 34590, 34591, 7803, 78031, 78032, 78033, 78039

Hypertension	O10011, O10012, O10013, O10019, O1002, O1003, O10111, O10112, O10113, O10119, O1012, O1013, O10211, O10212, O10213, O10219, O1022, O1023, O10311, O10312, O10313, O10319, O1032, O1033, O10411, O10412, O10413, O10419, O1042, O1043, O10911, O10912, O10913, O10919, O1092, O1093, O111, O112, O113, O114, O115, O119, O131, O132, O133, O134, O135, O139, O1400, O1402, O1403, O1404, O1405, O1410, O1412, O1413, O1414, O1415, O1420, O1422, O1423, O1424, O1425, O1490, O1492, O1493, O1494, O1495, O1500, O1502, O1503, O151, O152, O159, O161, O162, O163, O164, O165, O169, 64200, 64201, 64202, 64203, 64204, 64210, 64211, 64212, 64213, 64214, 64220, 64221, 64222, 64223, 64224, 64230, 64231, 64232, 64233, 64234, 64240, 64241, 64242, 64243, 64244, 64250, 64251, 64252, 64253, 64254, 64260, 64261, 64262, 64263, 64264, 64270, 64271, 64272, 64273, 64274, 64290, 64291, 64292, 64293, 64294, I10, I119, I150, I151, I152, I158, I159, I160, I161, I169, I674, 4010, 4011, 4019, 40200, 40201, 40210, 40211, 40290, 40291, 4030, 40300, 40301, 4031, 40310, 40311, 4039, 40390, 40391, 4040, 40400, 40401, 40402, 40403, 4041, 40410, 40411, 40412, 40413, 4049, 40490, 40491, 40492, 40493, 40501, 40509, 40511, 40519, 40591, 40599, 4372
Mental disorders	F060, F061, F062, F0630, F0631, F0632, F0633, F0634, F064, F068, F070, F079, F09, F200, F201, F202, F203, F205, F2081, F2089, F209, F21, F22, F23, F24, F250, F251, F258, F259, F28, F29, F3010, F3011, F3012, F3013, F302, F303, F304, F308, F309, F310, F3110, F3111, F3112, F3113, F312, F3130, F3131, F3132, F314, F315, F3160, F3161, F3162, F3163, F3164, F3170, F3171, F3172, F3173, F3174, F3175, F3176, F3177, F3178, F3181, F3189, F319, F320, F321, F322, F323, F324, F325, F328, F3281, F3289, F329, F330, F331, F332, F333, F3340, F3341, F3342, F338, F339, F340, F341, F348, F3481, F3489, F349, F39, F4000, F4001, F4002, F4010, F4011, F40210, F40218, F40220, F40228, F40230, F40231, F40232, F40233, F40240, F40241, F40242, F40243, F40248, F40290, F40291, F40298, F408, F409, F410, F411, F413, F418, F419, F42, F422, F423, F424, F428, F429, F430, F4310, F4311, F4312, F4320, F4321, F4322, F4323, F4324, F4325, F4329, F438, F439, F440, F441, F442, F444, F445, F446, F447, F4481, F4489, F449, F4522, F481, F488, F489, F520, F521, F5221, F5222, F5231, F5232, F524, F525, F526, F528, F53, F530, F531, F550, F551, F552, F553, F554, F558, F59, F600, F601, F602, F603, F604, F605, F606, F607, F6081, F6089, F609, F630, F631, F632, F633, F6381, F6389, F639, F640, F641, F642, F648, F649, F650, F651, F652, F653, F654, F6550, F6551, F6552, F6581, F6589, F659, F66, F688, F69, F910, F911, F912, F913, F918, F919, F930, F938, F939, F940, F941, F942, F989, F99, 2900, 29010, 29011, 29012, 29013, 29020, 29021, 2903, 29040, 29041, 29042, 29043, 2908, 2909, 2930, 2931, 29381, 29382, 29383, 29384, 2940, 2941, 29410, 29411, 29420, 29421, 2948, 2949, 29500, 29501, 29502, 29503, 29504, 29505, 29510, 29511, 29512, 29513, 29514, 29515, 29520, 29521, 29522, 29523, 29524, 29525, 29530, 29531, 29532, 29533, 29534, 29535, 29540, 29541, 29542, 29543, 29544, 29545, 29550, 29551, 29552, 29553, 29554, 29555, 29560, 29561, 29562, 29563, 29564, 29565, 29570, 29571, 29572, 29573, 29574, 29575, 29580, 29581, 29582, 29583, 29584, 29585, 29590, 29591, 29592, 29593, 29594, 29595, 29600, 29601, 29602, 29603, 29604, 29605, 29606, 29610, 29611, 29612, 29613, 29614, 29615, 29616, 29620, 29621, 29622, 29623, 29624, 29625, 29626, 29630, 29631, 29632, 29633, 29634, 29635, 29636, 29640, 29641, 29642, 29643, 29644, 29645, 29646, 29650, 29651, 29652, 29653, 29654, 29655, 29656, 29660, 29661, 29662, 29663, 29664, 29665, 29666, 2967, 29680, 29681, 29682, 29689, 29690, 29699, 2970, 2971, 2972, 2973, 2978, 2979, 2980, 2981, 2982, 2983, 2984, 2988, 2989, 30000, 30001, 30002, 30009, 30010, 30020, 30021, 30022, 30023, 30029, 3003, 3004, 3005, 30089, 3009, 3010, 30110, 30111, 30112, 30113, 30120, 30121, 30122, 3013, 3014, 30150, 30151, 30159, 3016, 3017, 30181, 30182, 30183, 30184, 30189, 3019, 3080, 3081, 3082, 3083, 3084, 3089, 3090, 3091, 30922, 30923, 30924, 30928, 30929, 3093, 3094, 30981, 30982, 30983, 30989, 3099, 3100, 3102, 3108, 31081, 31089, 3109, 311, 31200, 31201, 31202, 31203, 31210, 31211, 31212, 31213, 31220, 31221, 31222, 31223, 3124, 3128, 31281, 31282, 31289, 3129, 3130, 3131, 31321, 31322, 3133, 31381, 31382, 31383, 31400, 31401, 3141, 3142, 3148, 3149, 3310, 3311, 33111, 33119, 3312, 33182, 64840, 64841, 64842, 64843, 64844

Sexually transmitted diseases	A55, A5600, A5601, A5602, A5609, A5611, A5619, A562, A563, A564, A568, 09950, 09951, 09952, 09953, 09954, 09955, 09956, 09959, A5400, A5401, A5402, A5403, A5409, A541, A5421, A5422, A5423, A5424, A5429, A5440, A5441, A5442, A5443, A5449, A545, A546, A5481, A5482, A5483, A5484, A5485, A5489, A549, 0980, 09810, 09811, 09812, 09813, 09814, 09815, 09816, 09817, 09819, 0982, 09830, 09831, 09832, 09833, 09834, 09835, 09836, 09837, 09839, 09840, 09841, 09842, 09843, 09849, 09850, 09851, 09852, 09853, 09859, 0986, 0987, 09881, 09882, 09883, 09884, 09885, 09886, 09889, 0990, 0991, 0992, 0993, 0994, 09940, 09941, 09949, A510, A511, A512, A5131, A5132, A5139, A5141, A5142, A5143, A5144, A5145, A5146, A5149, A515, A519, A5200, A5201, A5202, A5203, A5204, A5205, A5206, A5209, A5210, A5211, A5212, A5213, A5214, A5215, A5216, A5217, A5219, A522, A523, A5271, A5272, A5273, A5274, A5275, A5276, A5277, A5278, A5279, A528, A529, A530, A539, 0900, 0901, 0902, 0903, 09040, 09041, 09042, 09049, 0905, 0906, 0907, 0909, 0910, 0911, 0912, 0913, 0914, 09150, 09151, 09152, 09161, 09162, 09169, 0917, 09181, 09182, 09189, 0919, 0920, 0929, 0930, 0931, 09320, 09321, 09322, 09323, 09324, 09381, 09382, 09389, 0939, 0940, 0941, 0942, 0943, 09481, 09482, 09483, 09484, 09485, 09486, 09487, 09489, 0949, 0950, 0951, 0952, 0953, 0954, 0955, 0956, 0957, 0958, 0959, 096, 0970, 0971, 0979, A57, A58, A5900, A5901, A5902, A5903, A5909, A598, A599, A6000, A6001, A6002, A6003, A6004, A6009, A601, A609, A630, A638, A64, 0998, 0999, 79505, 79515, 79519, 79675, 79679
Substance use	F1110, F1111, F11120, F11121, F11122, F11129, F1113, F1114, F11150, F11151, F11159, F11181, F11182, F11188, F1119, F1120, F1121, F11220, F11221, F11222, F11229, F1123, F1124, F11250, F11251, F11259, F11281, F11282, F11288, F1129, F1190, F11920, F11921, F11922, F11929, F1193, F1194, F11950, F11951, F11959, F11981, F11982, F11988, F1199, F1210, F1211, F12120, F12121, F12122, F12129, F1213, F12150, F12151, F12159, F12180, F12188, F1219, F1220, F1221, F12220, F12221, F12222, F12229, F1223, F12250, F12251, F12259, F12280, F12288, F1229, F1290, F12920, F12921, F12922, F12929, F1293, F12950, F12951, F12959, F12980, F12988, F1299, F1310, F1311, F13120, F13121, F13129, F13130, F13131, F13132, F13139, F1314, F13150, F13151, F13159, F13180, F13181, F13182, F13188, F1319, F1320, F1321, F13220, F13221, F13229, F13230, F13231, F13232, F13239, F1324, F13250, F13251, F13259, F1326, F1327, F13280, F13281, F13282, F13288, F1329, F1390, F13920, F13921, F13929, F13930, F13931, F13932, F13939, F1394, F13950, F13951, F13959, F1396, F1397, F13980, F13981, F13982, F13988, F1399, F1410, F1411, F14120, F14121, F14122, F14129, F1413, F1414, F14150, F14151, F14159, F14180, F14181, F14182, F14188, F1419, F1420, F1421, F14220, F14221, F14222, F14229, F1423, F1424, F14250, F14251, F14259, F14280, F14281, F14282, F14288, F1429, F1490, F14920, F14921, F14922, F14929, F1493, F1494, F14950, F14951, F14959, F14980, F14981, F14982, F14988, F1499, F1510, F1511, F15120, F15121, F15122, F15129, F1513, F1514, F15150, F15151, F15159, F15180, F15181, F15182, F15188, F1519, F1520, F1521, F15220, F15221, F15222, F15229, F1523, F1524, F15250, F15251, F15259, F15280, F15281, F15282, F15288, F1529, F1590, F15920, F15921, F15922, F15929, F1593, F1594, F15950, F15951, F15959, F15980, F15981, F15982, F15988, F1599, F1610, F1611, F16120, F16121, F16122, F16129, F1614, F16150, F16151, F16159, F16180, F16183, F16188, F1619, F1620, F1621, F16220, F16221, F16229, F1624, F16250, F16251, F16259, F16280, F16283, F16288, F1629, F1690, F16920, F16921, F16929, F1694, F16950, F16951, F16959, F16980, F16983, F16988, F1699, F1810, F1811, F18120, F18121, F18129, F1814, F18150, F18151, F18159, F1817, F18180, F18188, F1819, F1820, F1821, F18220, F18221, F18229, F1824, F18250, F18251, F18259, F1827, F18280, F18288, F1829, F1890, F18920, F18921, F18929, F1894, F18950, F18951, F18959, F1897, F18980, F18988, F1899, F1910, F1911, F19120, F19121, F19122, F19129, F19130, F19131, F19132, F19139, F1914, F19150, F19151, F19159, F1916, F1917, F19180, F19181, F19182, F19188, F1919, F1920, F1921, F19220, F19221, F19222, F19229, F19230, F19231, F19232, F19239, F1924, F19250, F19251, F19259, F1926, F1927, F19280, F19281, F19282, F19288, F1929, F1990, F19920, F19921, F19922, F19929, F19930, F19931, F19932, F19939, F1994, F19950, F19951, F19959, F1996, F1997, F19980, F19981, F19982, F19988, F1999, 2920, 29211, 29212, 2922, 29281, 29282, 29283, 29284, 29285, 29289, 2929, 30400, 30401, 30402, 30403, 30410, 30411, 30412, 30413, 30420, 30421,

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Tobacco use	F17203, F17208, F17209, F17213, F17218, F17219, F17223, F17228, F17229, F17293, F17298, F17299, 3051, 30510, 30511, 30512, 30513

**Appendix. Supplementary Table 3. Sensitivity Analysis for methods of controlling for comorbidities**

Medicaid	NTD among livebirths aRR (95% CI)	
	Models with combined comorbidity index	Models with separate comorbidity variables
Pregnancies among women with HIV and DTG exposure vs. pregnancies among women without HIV	1.81 (0.26, 12.89)	1.64 (0.23, 11.68)
Pregnancies among women with HIV and non-DTG ARV vs. pregnancies among women without HIV	0.66 (0.21, 2.06)	0.62 (0.20, 1.92)
Pregnancies among women with HIV and DTG exposure vs. Pregnancies among women with HIV and non-DTG ARV	2.97 (0.31, 28.89)	2.52 (0.21, 29.83)*

\*: Model does not converge and the estimate is questionable

**Women with any diagnosis before or during pregnancy were coded with 12 comorbidity variables to indicate the presence of a comorbidity group. One combined comorbidity index variable was generated if one had any comorbidity before or during the pregnancy.**

**Appendix. Supplementary Table 4. Characteristics of pregnant women with and without full health insurance enrollment during their pregnancy by health insurance type, United States 2008 -2020**

	MarketScan				Medicaid			
	Full enrollment		Non-full enrollment		Full enrollment		Non-full enrollment	
	N	%	N	%	N	%	N	%
<b>Total</b>	<b>4,489,315</b>		<b>1,558,567</b>		<b>14,405,861</b>		<b>5,558,336</b>	
<b>Race and Ethnicity</b>								
White	N/A	N/A	N/A	N/A	5,414,147	37.6	1,780,116	32.0
Black	N/A	N/A	N/A	N/A	3,322,281	23.1	875,995	15.8
Hispanic/Latino	N/A	N/A	N/A	N/A	4,115,133	28.6	2,076,042	37.4
Other*	N/A	N/A	N/A	N/A	763,473	5.3	294,195	5.3
Unknown	N/A	N/A	N/A	N/A	790,827	5.5	531,988	9.6
<b>Age at delivery</b>								
15-24	628,222	14.0	245,778	15.8	6,090,540	42.3	2,086,649	37.5
25-34	2,613,172	58.2	959,187	61.5	6,658,085	46.2	2,754,166	49.6
35-44	1,214,066	27.0	346,367	22.2	1,621,453	11.3	705,350	12.7
45-49	33,855	0.8	7,235	0.5	35,783	0.2	12,171	0.2
<b>Census Region</b>								
Northeast	787,506	17.5	284,687	18.3	2,829,978	19.6	686,174	12.3
Midwest	1,005,783	22.4	345,782	22.2	1,978,231	13.7	534,689	9.6
South	1,790,748	39.9	590,233	37.9	5,217,825	36.2	3,053,229	54.9
West	847,386	18.9	304,413	19.5	4,379,827	30.4	1,284,244	23.1
Other	57,892	1.3	33,452	2.1	0	-	0	-

N/A: not available.

\*Other includes American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, and other. Hispanic/Latino persons can be of any race.

**Appendix. Supplementary Table 5. Neural tube defects among pregnancies and livebirths in women aged 15-49 years fully enrolled in commercial health insurance or Medicaid, by type of antiretroviral exposure and timing of such exposure, United States 2008-2020: Sensitivity analyses based on a range of assumptions.**

	Women without HIV		Women with HIV and periconceptual* DTG exposure			Women with HIV and periconceptual* non-DTG ARV exposure		
	N NTD	Rate per 10,000 (95% CI)**	N NTD	Rate per 10,000 (95% CI)**	RR (95% CI) <sup>§</sup>	N NTD	Rate per 10,000 (95% CI)**	RR (95% CI) <sup>§</sup>
<b>MarketScan</b>								
NTD among all pregnancies <sup>†</sup>	1,902	4.2 (4.1 ~ 4.4)	0	0.0 (0.0 ~ 534.6)	-- <sup>¶</sup>	0	0.0 (0.0 ~ 37.1)	-- <sup>¶</sup>
NTD among livebirths	1,352	4.1 (3.9 ~ 4.3)	0	0.0 (0.0 ~ 945.9)	-- <sup>¶</sup>	0	0.0 (0.0 ~ 57.0)	-- <sup>¶</sup>
Assuming one third of all NTD resulted in fetal loss <sup>‡</sup>	2,028	6.1 (5.9 ~ 6.4)	0	0.0 (0.0 ~ 945.9)	-- <sup>¶</sup>	0	0.0 (0.0 ~ 57.0)	-- <sup>¶</sup>
Assuming one half of all NTD resulted in fetal loss <sup>‡</sup>	2,704	8.2 (7.8 ~ 8.5)	0	0.0 (0.0 ~ 945.9)	-- <sup>¶</sup>	0	0.0 (0.0 ~ 57.0)	-- <sup>¶</sup>
<b>Medicaid</b>								
NTD among all pregnancies <sup>†</sup>	7,164	5.0 (4.9 ~ 5.1)	1	6.8 (0.2 ~ 38.1)	1.73 (0.24, 12.28)	3	2.7 (0.6 ~ 7.9)	0.61 (0.20, 1.89)
NTD among livebirths	6,639	5.7 (5.6 ~ 5.8)	1	10.6 (0.3 ~ 59.3)	1.87 (0.26, 13.25)	3	3.8 (0.8 ~ 11.0)	0.66 (0.21, 2.04)
Assuming one third of all NTD resulted in fetal loss <sup>‡</sup>	9,959	8.6 (8.4 ~ 8.7)	2	21.3 (2.6 ~ 76.9)	2.73 (0.68, 10.93)	5	6.3 (2.0 ~ 14.6)	0.80 (0.33, 1.93)
Assuming one half of all NTD resulted in fetal loss <sup>‡</sup>	13,278	11.4 (11.2 ~ 11.6)	2	21.3 (2.6 ~ 76.9)	1.86 (0.47, 7.46)	6	7.5 (2.8 ~ 16.3)	0.66 (0.30, 1.47)

N = number, DTG = dolutegravir, ARV = antiretroviral, NTD = neural tube defect, RR = risk ratio, CI= confidence interval.

\*Periconceptual exposure was defined as exposure from 8 weeks prior to the last menstrual period through 13 6/7 weeks gestation.

\*\*We calculated the incidence rate using a denominator of the number of livebirths plus assumed additional NTD cases.

<sup>§</sup>We calculated relative risk using a multivariable Poisson regression model with the reference group of women without HIV. Models were adjusted for year, age at delivery, U.S. Census region, race/ethnicity (Medicaid only), and maternal comorbidities.

<sup>†</sup>We included all NTD cases observed among livebirths, stillbirths, and early pregnancy losses.

<sup>‡</sup>We assumed a proportion of all NTD resulted in pregnancy loss and not in live births, and included these additional NTD cases in both numerator and denominator.

<sup>¶</sup>Adjusted RRs cannot be calculated using multivariable regression models because of too few cases of the outcome.

**Appendix. Supplementary Table 6. Neural tube defects and pregnancy outcomes among women aged 15-49 years fully enrolled in commercial health insurance and Medicaid, by type of antiretroviral exposure and timing of such exposure, United States 2008-2020**

	Pregnancies among women without HIV		Pregnancies among women with HIV and no periconceptual* ARV record		
	N	Rate per 10,000 (95% CI)	N	Rate per 10,000 (95% CI)	Adjusted Risk Ratio <sup>†</sup> (95% CI)
<b>MarketScan</b>					
Livebirth	3,316,459		2,808		
NTD <sup>‡</sup>	1,352	4.1 (3.9 ~ 4.3)	3	10.7 (2.2 ~ 31.2)	2.37 (0.76 ~ 7.35)
<b>Medicaid</b>					
Livebirth	11,642,251		32,889		
NTD <sup>‡</sup>	6,639	5.7 (5.6 ~ 5.8)	20	6.1 (0.3 ~ 59.3)	0.98 (0.63 ~ 1.53)

N = number, DTG = dolutegravir, ARV = antiretroviral, NTD = neural tube defect.

95% CI: 95% confidence intervals assuming a Poisson distribution.

\*Periconceptual exposure was defined as exposure from 8 weeks prior to the last menstrual period through 13 6/7 weeks gestation.

<sup>†</sup> Multivariable regression models were adjusted for year, age at delivery, U.S. Census region, race/ethnicity (Medicaid only), and maternal comorbidities.

<sup>‡</sup> Rate of NTD was calculated among livebirths.

## Appendix. Supplemental Reading List

1. Centers for Disease Control and Prevention. Spina bifida and anencephaly before and after folic acid mandate--United States, 1995-1996 and 1999-2000. *MMWR Morb Mortal Wkly Rep* 2004;53(17):362-365.
2. Greene ND, Copp AJ. Neural tube defects. *Annu Rev Neurosci* 2014;37:221-42.
3. Hartge DR, Gembicki M, Rody A, et al. Neural tube defects in embryonic life: Lessons learned from 340 early pregnancy failures. *J Ultrasound Med* 2018 Dec;37(12):2841-2847. DOI: 10.1002/jum.14642.
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