

SUPPLEMENTAL DIGITAL CONTENT

Table S1. Proportion of those meeting different linkage metric measures, as well as retention in care metrics and virologic suppression metrics, of 1781 newly-diagnosed persons with HIV, Philadelphia, 2007-2008.*

Linkage Metric	Met linkage metric N= (percentage)	Of those meeting linkage metric, met retention metric N= (percentage of those meeting linkage metric)	Of those meeting linkage metric, met virologic suppression metric N= (percentage of those meeting linkage metric)
Visit within 30 Days of Diagnosis	363 (20.4%)	226 (62.3%)	147 (40.5%)
Visit within 60 Days of Diagnosis	473 (26.6%)	302 (63.8%)	190 (40.2%)
Visit within 90 Days of Diagnosis	530 (29.8%)	336 (63.4%)	215 (40.6%)
Visit within 180 Days of Diagnosis	614 (34.5%)	391 (63.7%)	250 (40.7%)
Visit within 365 Days of Diagnosis	703 (39.5%)	447 (63.6%)	282 (40.1%)
Visit Between 21 and 60 Days of Diagnosis	391 (22.0%)	256 (65.5%)	175 (44.8%)
Visit Between 21 and 90 Days of Diagnosis	473 (26.6%)	308 (65.1%)	206 (43.6%)
Visit Between 21 and 180 Days of Diagnosis	576 (32.3%)	376 (65.3%)	244 (42.4%)

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Visit Between 21 and 365 Days of Diagnosis	680(38.2%)	443 (65.2%)	281 (41.3%)
Two Visits within 90 Days of Diagnosis	384 (21.6%)	261 (68.0%)	164 (42.7%)
Two Visits within 180 Days of Diagnosis	496 (27.9%)	342 (69.0%)	212 (42.7%)
Two Visits within 365 Days of Diagnosis	610 (34.3%)	416 (68.2%)	254 (41.6%)
Two Visits within 180 Days of Diagnosis, Separated by 90 Days	312 (17.5%)	229 (73.4%)	153 (49.0%)
Two Visits within 365 Days of Diagnosis, Separated by 90 Days	508 (28.5%)	377 (74.2%)	247 (38.6%)
Test within 30 Days of Diagnosis	1014 (56.9%)	324 (32.0%)	284 (28.0%)
Test within 60 Days of Diagnosis	1205 (67.7%)	387 (32.1%)	335 (27.8%)
Test within 90 Days of Diagnosis	1282 (72.0%)	417 (32.5%)	355 (27.7%)
Test within 180 Days of Diagnosis	1382 (77.6%)	463 (33.5%)	392 (28.4%)
Test within 365 Days of	1454 (81.6%)	485 (33.4%)	412 (28.3%)

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Diagnosis			
Test after 21 Days but before 60 Days of Diagnosis	643 (36.1%)	258 (40.1%)	231 (35.9%)
Test after 21 Days but before 90 Days of Diagnosis	818 (45.9%)	325 (39.7%)	287 (35.1%)
Test after 21 Days but before 180 Days of Diagnosis	1075 (60.3%)	429 (39.9%)	363 (33.8%)
Test after 21 Days but before 365 Days of Diagnosis	1226 (68.8%)	475 (38.7%)	405 (33.0%)
Two Tests within 90 Days of Diagnosis	370 (37.6%)	313 (46.7%)	313 (46.7%)
Two Tests within 180 Days of Diagnosis	954 (53.6%)	414 (43.4%)	414 (43.4%)
Two Tests within 365 Days of Diagnosis	1139 (64.0%)	467 (41.0%)	467 (41.0%)
Two Tests within 180 Days of Diagnosis, Separated by 90 Days	605 (34.0%)	281 (46.5%)	245 (40.5%)
Two Tests within 365 Days	1003 (56.3%)	445 (44.4%)	377 (37.6%)

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of Diagnosis, Separated by 90 Days			
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*Retention in care defined as two clinic visits spaced 90 days apart in one year, **between 365 and 730 days after diagnosis**, of 1781 patients. **Visits refer to clinic visits for HIV care; i.e., an outpatient visit with a provider with prescribing privileges in an HIV care setting. Virologic suppression was defined as a HIV-1 RNA viral load less than 200 copies/ml , as the first viral load sent after 365 days but less than 730 days (two years) after diagnosis.** Tests refer to laboratory tests drawn, including CD4 T-cell counts and HIV-1 RNA levels. **Either a CD4 T-cell count or HIV-1 RNA level was considered a laboratory test. If two laboratory tests were drawn, these must have been drawn on separate days. The date of the laboratory test was the date that the laboratory test was drawn, regardless of when it was entered into the database. No values were missing.**

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Table S2: Describing those who met the linkage metric of at least one clinic visit between 21 and 365 days after diagnosis, by sociodemographic characteristic, of 1781 persons diagnosed with HIV in Philadelphia, 2007-2008.*

Sociodemographic Characteristic	Total N= (percentage)	Met linkage metric N= (percentage of total in demographic category)	Of those meeting linkage metric, met retention metric N= (percentage of those meeting linkage metric)	Of those meeting linkage metric, met virologic suppression metric N= (percentage of those meeting linkage metric)
Overall	1781 (100.)	363 (20.4)	226 (62.3)	147 (40.5)
Race/Ethnicity (missing)	0 (0)	--	--	--
White	308 (17.3)	105 (34.1)	69 (65.7)	47 (44.8)
Black	1128 (63.3)	449 (39.8)	292 (65.0)	177 (39.4)
Hispanic †	269 (15.1)	92 (34.2)	63 (68.5)	41 (44.6)
Other	76 (4.27)	34 (44.7)	19 (55.9)	16 (47.1)
Gender (missing)	0 (0)	--	--	--
Male	1249 (70.1)	449 (36.0)	284 (63.3)	188 (41.9)
Female	532 (29.9)	231 (43.4)	159 (68.8)	93 (43.4)
Age at diagnosis (missing)	0 (0)	--	--	--

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18-29 years	598 (33.6)	280 (46.8)	184 (65.7)	94 (33.6)
30-39 years	429 (24.1)	165 (38.5)	105 (63.6)	70 (42.4)
40-49 years	463 (26.0)	151 (32.6)	95 (62.9)	68 (45.0)
≥50 years	291 (16.3)	84 (28.9)	59 (70.2)	49 (58.3)
HIV exposure (missing)	7 (0.39)	0 (0)	0 (0)	0 (0)
Heterosexual	885 (49.7)	356 (40.2)	237 (66.6)	159 (44.7)
IDU	304 (17.1)	81 (26.6)	48 (59.3)	28 (34.6)
MSM	558 (33.7)	238 (42.7)	154 (64.7)	91 (38.2)
Other	27 (1.5)	5 (18.5)	4 (80.0)	3 (60.0)
Country of birth (missing)	11 (0.62)	4 (36.4)	4 (100.)	3 (75.0)
Born inside US	1588 (89.2)	599 (37.7)	391 (65.3)	37 (48.1)
Born outside US	182 (10.2)	77 (42.3)	48 (62.3)	241 (40.2)

*Linkage to care defined as at least one clinic visit for HIV care (**i.e., an outpatient visit with a provider with prescribing privileges in an HIV care setting**), **between 21 and 365 days after diagnosis**. Retention in care defined as two clinic visits spaced 90 days apart in one year, **between 365 and 730 days after diagnosis**, of 1781 patients. **Virologic suppression was defined as a HIV-1 RNA viral load less than 200 copies/ml , as the first viral load sent after 365 days but less than 730 days (two years) after diagnosis.**

† Patients who identified as both Hispanic and another race were considered Hispanic.

Abbreviations: MSM: men having sex with men; IDU: injection drug use; US: United States.

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Table S3: Sensitivity, specificity, PPV, NPV and unadjusted OR for retention in care, assuming an additional 29% of persons living with HIV were retained in care, of 1781 newly diagnosed persons with HIV, Philadelphia, 2007-2008.*

	Sensitivity	Specificity	PPV	NPV	OR
Test within 30 Days of Diagnosis	0.644	0.467	0.412	0.699	1.63
Test within 60 Days of Diagnosis	0.770	0.368	0.414	0.556	1.52
Test within 90 Days of Diagnosis	0.829	0.343	0.420	0.778	2.53
Test within 180 Days of Diagnosis	0.920	0.293	0.432	0.870	5.12
Test within 365 Days of Diagnosis	0.964	0.255	0.430	0.923	9.88
Test after 21 Days but before 60 Days of Diagnosis	0.513	0.712	0.518	0.723	2.79
Test after 21 Days but before 90 Days of Diagnosis	0.646	0.631	0.497	0.687	4.51
Test after 21 Days but before 180 Days of Diagnosis	0.853	0.516	0.515	0.865	6.79
Test after 21 Days but before 365 Days of Diagnosis	0.945	0.435	0.500	0.935	14.35
Two Tests within 90 Days of Diagnosis	0.622	0.742	0.603	0.779	5.36
Two Tests within 180 Days of Diagnosis	0.824	0.603	0.560	0.861	7.89

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Two Tests within 365 Days of Diagnosis	0.929	0.500	0.529	0.928	14.40
Two Tests within 180 Days of Diagnosis, Separated by 90 Days	0.559	0.709	0.599	0.756	4.64
Two Tests within 365 Days of Diagnosis, Separated by 90 Days	0.884	0.592	0.572	0.904	12.58

* Retention in care defined as two clinic visits spaced 90 days apart in one year, **between 365 and 730**

days after diagnosis, of 1781 patients. **Visits refer to clinic visits for HIV care; i.e., an outpatient visit with a provider with prescribing privileges in an HIV care setting.** Tests refer to laboratory tests sent, including CD4 T-cell counts and HIV-1 RNA levels. **Either a CD4 T-cell count or HIV-1 RNA level was considered a laboratory test. If two laboratory tests were drawn, these must have been drawn on separate days. The date of the laboratory test was the date that the laboratory test was drawn, regardless of when it was entered into the database. Estimates are unadjusted estimates. Sensitivity for retention in care was defined as the proportion of those meeting the retention in care criteria who met the linkage criteria. Similarly, specificity for retention in care was defined as the proportion of those not retained in care who did not meet the linkage criteria. PPV was defined as the proportion of those meeting linkage criteria who were retained in care, and NPV was defined as the proportion of those not meeting linkage criteria who were not retained in care.**

Abbreviations: PPV: Positive predictive value; NPV: negative predictive value; OR: odds ratio; HIV: human immunodeficiency virus; AIDS: acquired immunodeficiency syndrome

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Table S4: Sensitivity, specificity, PPV, NPV and unadjusted OR for retention in care, assuming an additional 29% of persons living with HIV were both linked to and retained in care, of 1781 newly diagnosed persons with HIV, Philadelphia, 2007-2008.*

	Sensitivity	Specificity	PPV	NPV	OR
Visit within 30 Days of Diagnosis	0.499	0.852	0.623	0.777	5.75
Visit within 60 Days of Diagnosis	0.600	0.805	0.638	0.779	6.21
Visit within 90 Days of Diagnosis	0.668	0.779	0.634	0.740	7.09
Visit within 180 Days of Diagnosis	0.777	0.754	0.644	0.855	10.7
Visit within 365 Days of Diagnosis	0.889	0.708	0.636	0.917	19.4
Visit Between 21 and 60 Days of Diagnosis	0.509	0.846	0.655	0.750	5.70
Visit Between 21 and 90 Days of Diagnosis	0.612	0.812	0.651	0.785	6.82
Visit Between 21 and 180 Days of Diagnosis	0.748	0.772	0.653	0.842	10.0
Visit Between 21 and 365 Days of Diagnosis	0.881	0.730	0.651	0.914	20.0
Two Visits within 90 Days of Diagnosis	0.519	0.806	0.680	0.757	6.62
Two Visits within 180 Days of Diagnosis	0.680	0.825	0.690	0.818	9.98
Two Visits within 365 Days of Diagnosis	0.827	0.779	0.682	0.887	16.8

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Two Visits within 180 Days of Diagnosis, Separated by 90 Days	0.455	0.905	0.734	0.744	8.00
Two Visits within 365 Days of Diagnosis, Separated by 90 Days	0.750	0.851	0.742	0.856	17.1

* Retention in care defined as two clinic visits spaced 90 days apart in one year, **between 365 and 730**

days after diagnosis, of 1781 patients. **Visits refer to clinic visits for HIV care; i.e., an outpatient visit with a provider with prescribing privileges in an HIV care setting.** Tests refer to laboratory tests sent, including CD4 T-cell counts and HIV-1 RNA levels. **Either a CD4 T-cell count or HIV-1 RNA level was considered a laboratory test. If two laboratory tests were drawn, these must have been drawn on separate days. The date of the laboratory test was the date that the laboratory test was drawn, regardless of when it was entered into the database. Estimates are unadjusted estimates. Sensitivity for retention in care was defined as the proportion of those meeting the retention in care criteria who met the linkage criteria. Similarly, specificity for retention in care was defined as the proportion of those not retained in care who did not meet the linkage criteria. PPV was defined as the proportion of those meeting linkage criteria who were retained in care, and NPV was defined as the proportion of those not meeting linkage criteria who were not retained in care.**

Abbreviations: PPV: Positive predictive value; NPV: negative predictive value; OR: odds ratio; HIV:

human immunodeficiency virus; AIDS: acquired immunodeficiency syndrome

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Table S5: Sensitivity, specificity, PPV, NPV and unadjusted OR for virologic suppression, assuming an additional 15% of persons living with HIV achieved virologic suppression, of 1781 newly diagnosed persons with HIV, Philadelphia, 2007-2008.*

	Sensitivity	Specificity	PPV	NPV	OR
Visit within 30 Days of Diagnosis	0.351	0.850	0.466	0.821	3.09
Visit within 60 Days of Diagnosis	0.455	0.805	0.463	0.805	3.44
Visit within 90 Days of Diagnosis	0.514	0.832	0.466	0.864	4.05
Visit within 180 Days of Diagnosis	0.599	0.749	0.469	0.835	4.46
Visit within 365 Days of Diagnosis	0.674	0.880	0.461	0.854	12.18
Visit Between 21 and 60 Days of Diagnosis	0.419	0.854	0.514	0.799	4.21
Visit Between 21 and 90 Days of Diagnosis	0.493	0.818	0.501	0.813	4.38
Visit Between 21 and 180 Days of Diagnosis	0.584	0.773	0.488	0.834	4.79
Visit Between 21 and 365 Days of Diagnosis	0.672	0.725	0.475	0.856	6.70
Two Visits within 90 Days of Diagnosis	0.393	0.850	0.492	0.791	3.67
Two Visits within 180 Days of Diagnosis	0.507	0.806	0.492	0.816	4.28
Two Visits within 365 Days of Diagnosis	0.907	0.755	0.417	0.839	4.77

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Two Visits within 180 Days of Diagnosis, Separated by 90 Days	0.366	0.895	0.564	0.792	4.94
Two Visits within 365 Days of Diagnosis, Separated by 90 Days	0.590	0.828	0.559	0.845	6.92

*** Virologic suppression was defined as a HIV-1 RNA viral load less than 200 copies/ml , as the first viral load sent after 365 days but less than 730 days (two years) after diagnosis. Visits refer to clinic visits for HIV care; i.e., an outpatient visit with a provider with prescribing privileges in an HIV care setting. Tests refer to laboratory tests sent, including CD4 T-cell counts and HIV-1 RNA levels. Either a CD4 T-cell count or HIV-1 RNA level was considered a laboratory test. If two laboratory tests were drawn, these must have been drawn on separate days. The date of the laboratory test was the date that the laboratory test was drawn, regardless of when it was entered into the database. Estimates are unadjusted estimates. Sensitivity for virologic suppression was defined as the proportion of those meeting the virologic suppression criteria who met the linkage criteria. Similarly, specificity for virologic suppression was defined as the proportion of those not retained in care who did not meet the linkage criteria. PPV was defined as the proportion of those meeting linkage criteria who achieved virologic suppression, and NPV was defined as the proportion of those not meeting linkage criteria who did not achieve virologic suppression.**

Abbreviations: PPV: Positive predictive value; NPV: negative predictive value; OR: odds ratio; HIV: human immunodeficiency virus; AIDS: acquired immunodeficiency syndrome

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Table S6: Sensitivity, specificity, PPV, NPV and unadjusted OR for virologic suppression, assuming an additional 29% of persons living with HIV were linked to care via clinic visit metrics, of 1781 newly diagnosed persons with HIV, Philadelphia, 2007-2008.*

	Sensitivity	Specificity	PPV	NPV	OR
Visit within 30 Days of Diagnosis	0.454	0.656	0.288	0.797	1.59
Visit within 60 Days of Diagnosis	0.586	0.732	0.402	0.852	3.88
Visit within 90 Days of Diagnosis	0.664	0.702	0.406	0.872	4.64
Visit within 180 Days of Diagnosis	0.772	0.754	0.444	0.903	6.43
Visit within 365 Days of Diagnosis	0.870	0.602	0.401	0.938	8.83
Visit Between 21 and 60 Days of Diagnosis	0.225	0.893	0.392	0.790	2.43
Visit Between 21 and 90 Days of Diagnosis	0.302	0.863	0.403	0.801	2.73
Visit Between 21 and 180 Days of Diagnosis	0.410	0.816	0.407	0.819	3.10
Visit Between 21 and 365 Days of Diagnosis	0.493	0.762	0.397	0.824	3.13
Two Visits within 90 Days of Diagnosis	0.762	0.753	0.486	0.912	9.77
Two Visits within 180 Days of Diagnosis	0.654	0.731	0.427	0.873	5.15
Two Visits within 365 Days of Diagnosis	0.784	0.663	0.416	0.887	7.14
Two Visits within 180 Days of	0.472	0.850	0.490	0.840	5.05

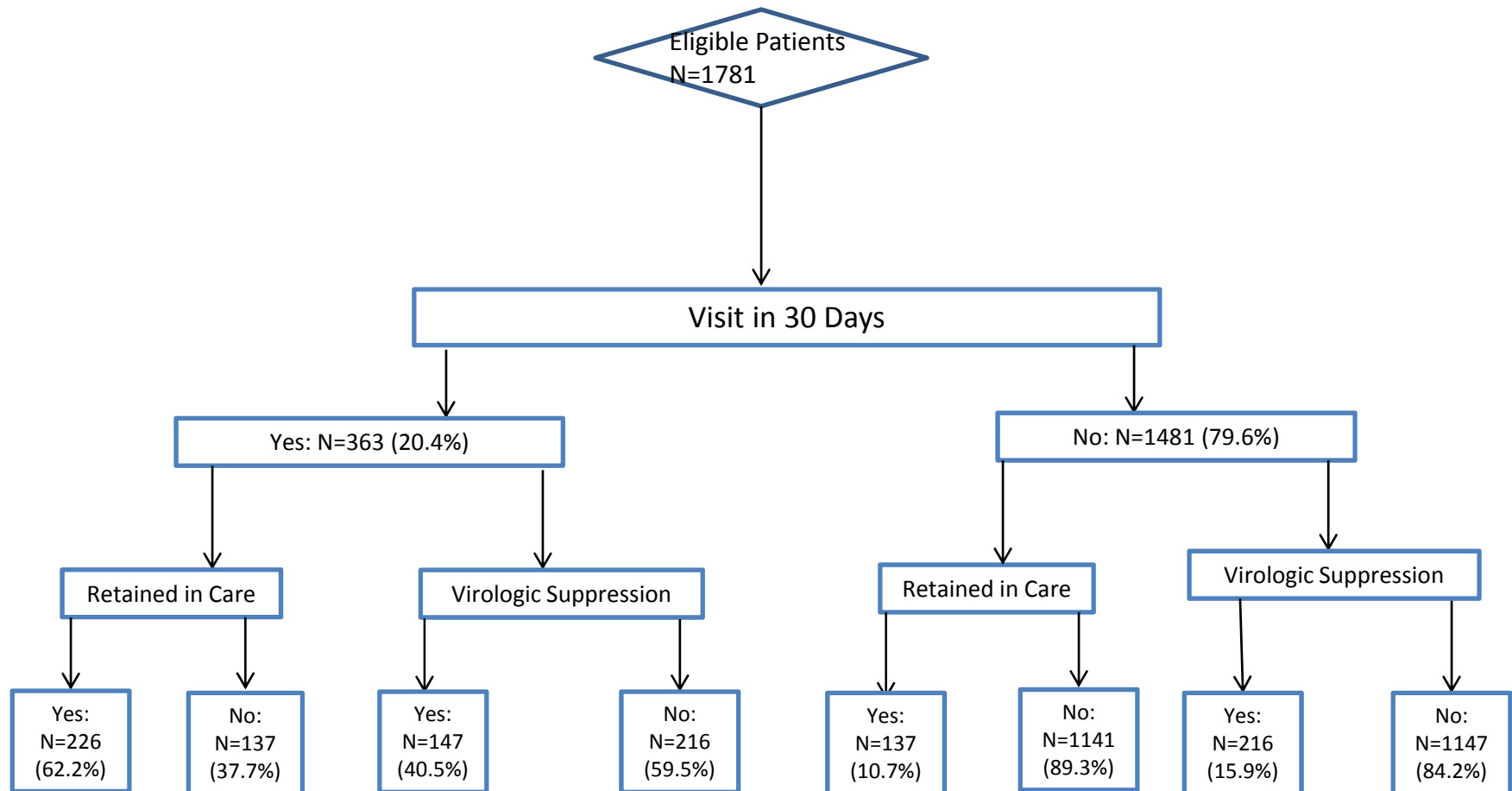
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Diagnosis, Separated by 90 Days					
Two Visits within 365 Days of Diagnosis, Separated by 90 Days	0.762	0.753	0.486	0.912	9.77

* Virologic suppression was defined as a HIV-1 RNA viral load less than 200 copies/ml , as the first viral load sent after 365 days but less than 730 days (two years) after diagnosis. Visits refer to clinic visits for HIV care; i.e., an outpatient visit with a provider with prescribing privileges in an HIV care setting. Tests refer to laboratory tests sent, including CD4 T-cell counts and HIV-1 RNA levels. **Either a CD4 T-cell count or HIV-1 RNA level was considered a laboratory test. If two laboratory tests were drawn, these must have been drawn on separate days. The date of the laboratory test was the date that the laboratory test was drawn, regardless of when it was entered into the database. Estimates are unadjusted estimates. Sensitivity for virologic suppression was defined as the proportion of those meeting the virologic suppression criteria who met the linkage criteria. Similarly, specificity for virologic suppression was defined as the proportion of those not virologically suppressed who did not meet the linkage criteria. PPV was defined as the proportion of those meeting linkage criteria who achieved virologic suppression, and NPV was defined as the proportion of those not meeting linkage criteria who were not virologically suppressed.**

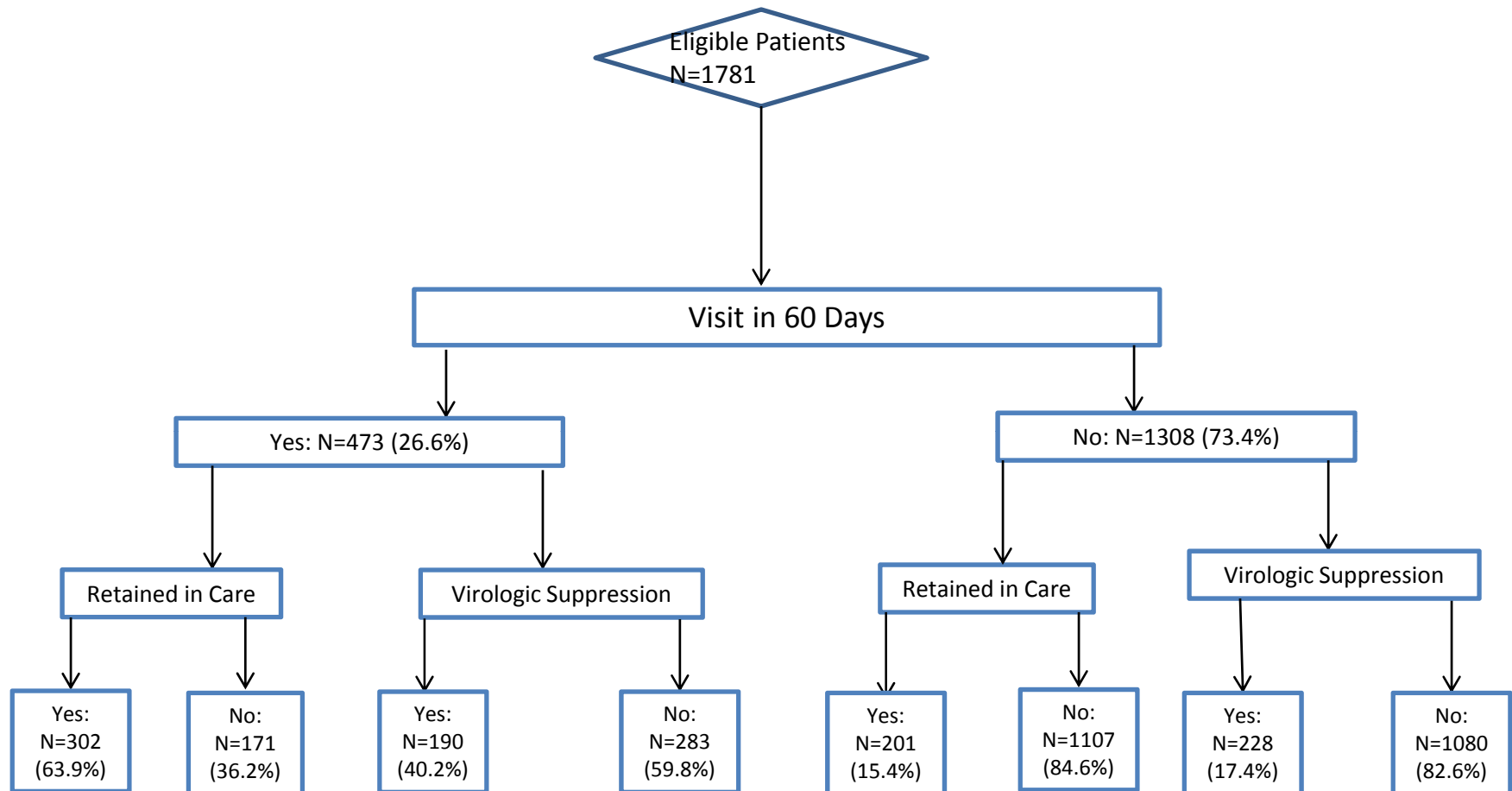
Abbreviations: PPV: Positive predictive value; NPV: negative predictive value; OR: odds ratio; HIV: human immunodeficiency virus; AIDS: acquired immunodeficiency syndrome

Figure S1. Flowsheet for Linkage Metric: Clinic Visit in 30 Days of Diagnosis



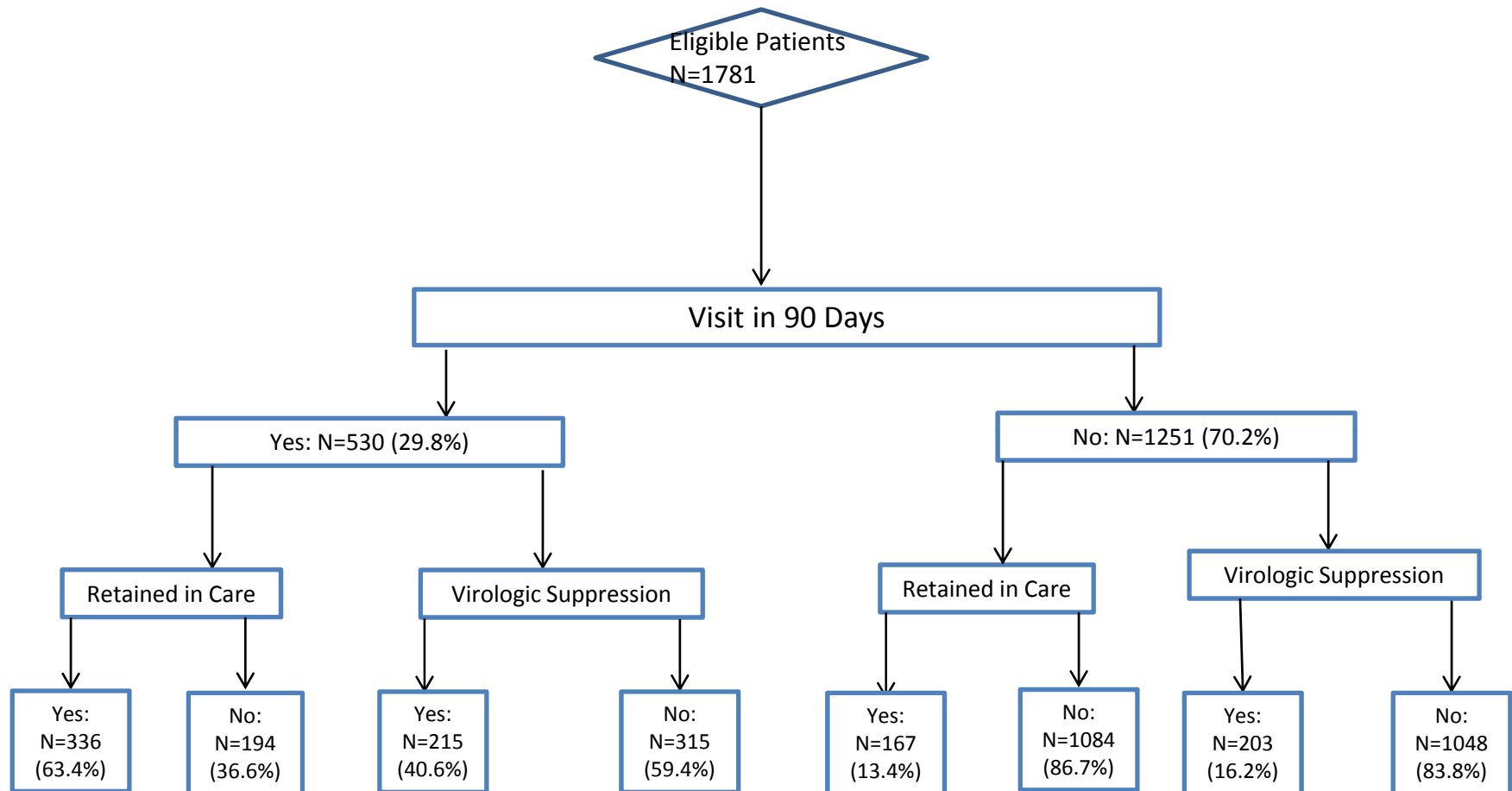
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S2. Flowsheet for Linkage Metric: Clinic Visit in 60 Days of Diagnosis



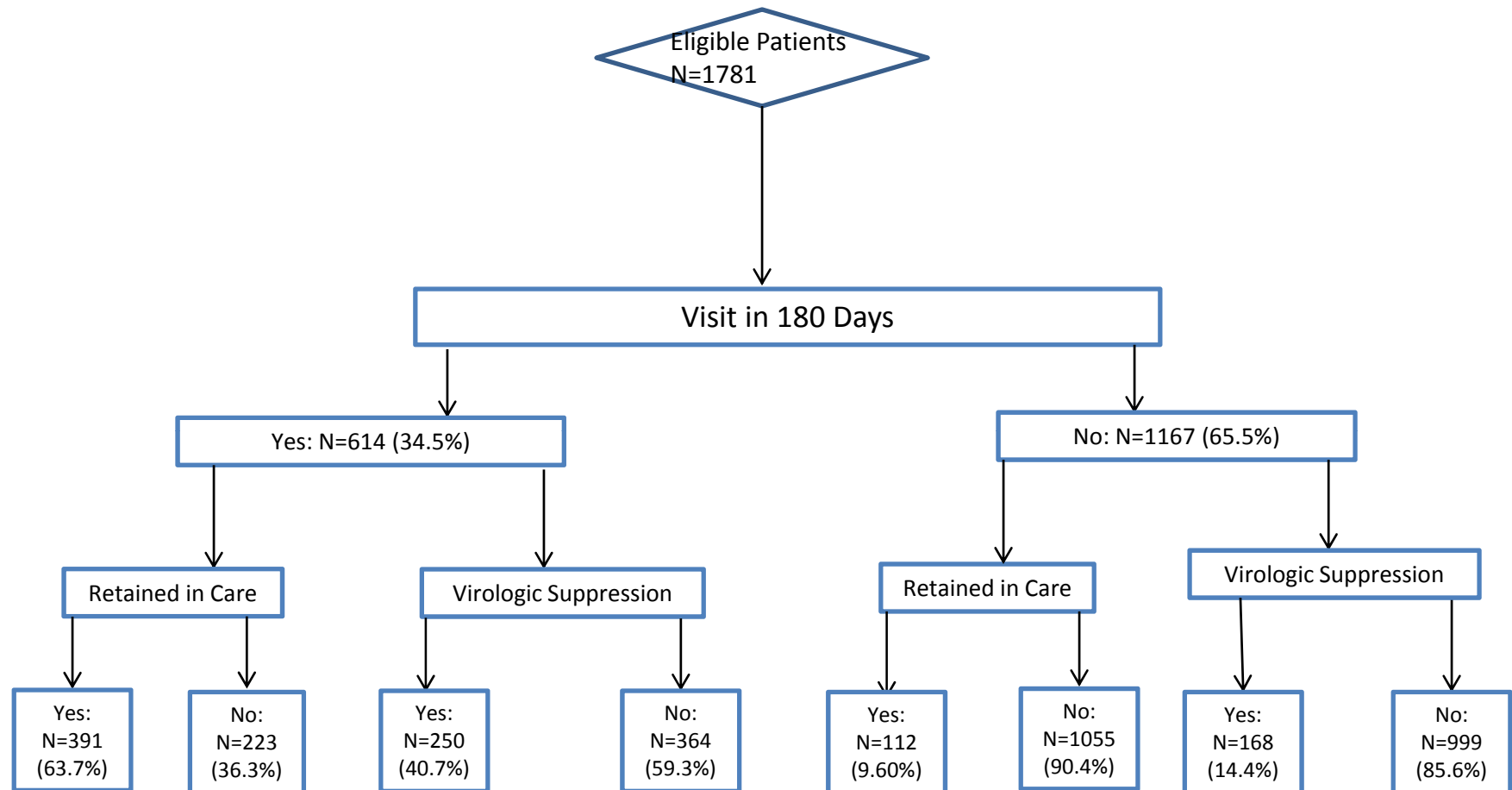
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S 3. Flowsheet for Linkage Metric: Clinic Visit in 90 Days of Diagnosis



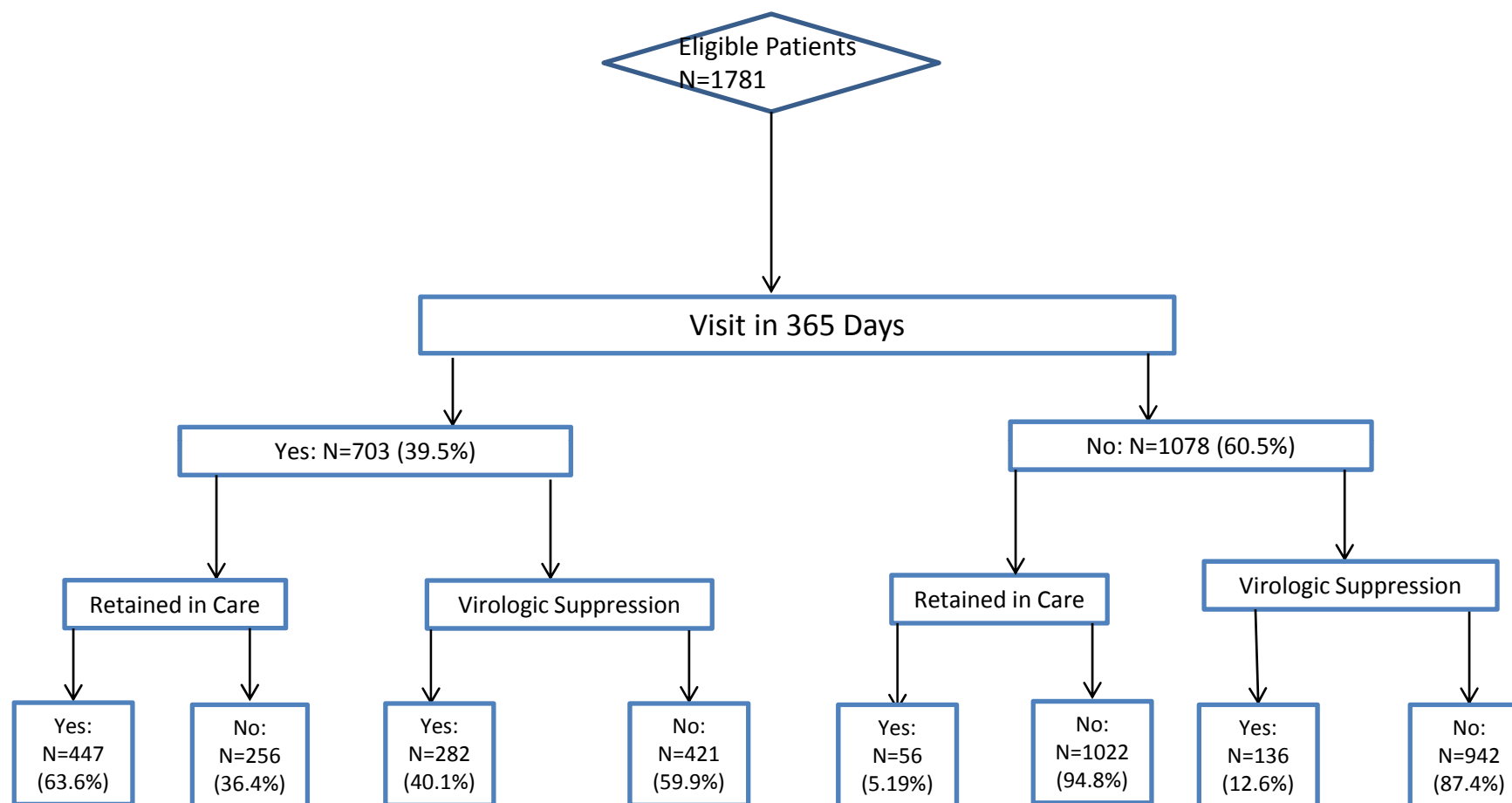
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S4. Flowsheet for Linkage Metric: Clinic Visit in 180 Days of Diagnosis



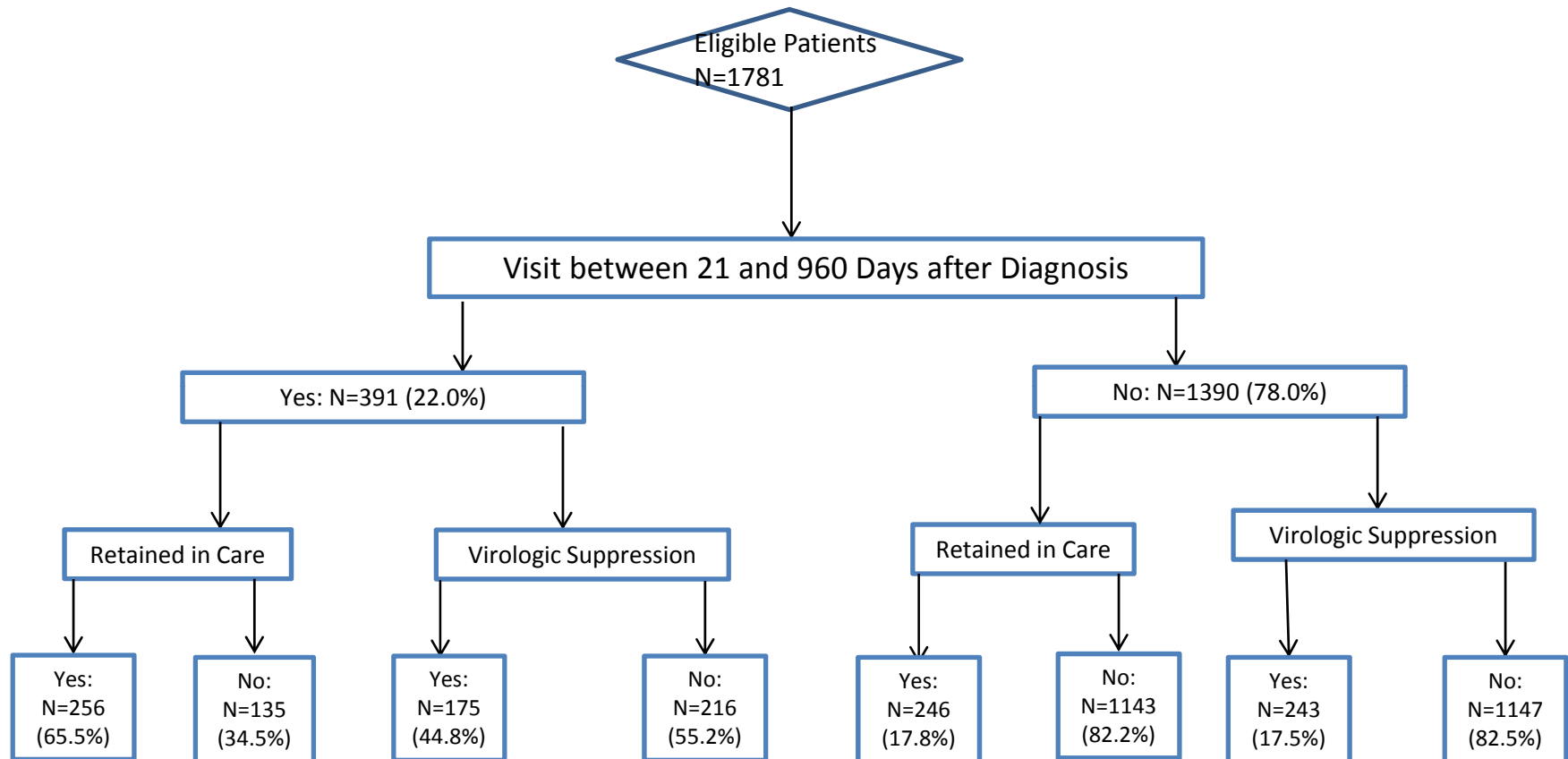
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S5. Flowsheet for Linkage Metric: Clinic Visit in 365 Days of Diagnosis



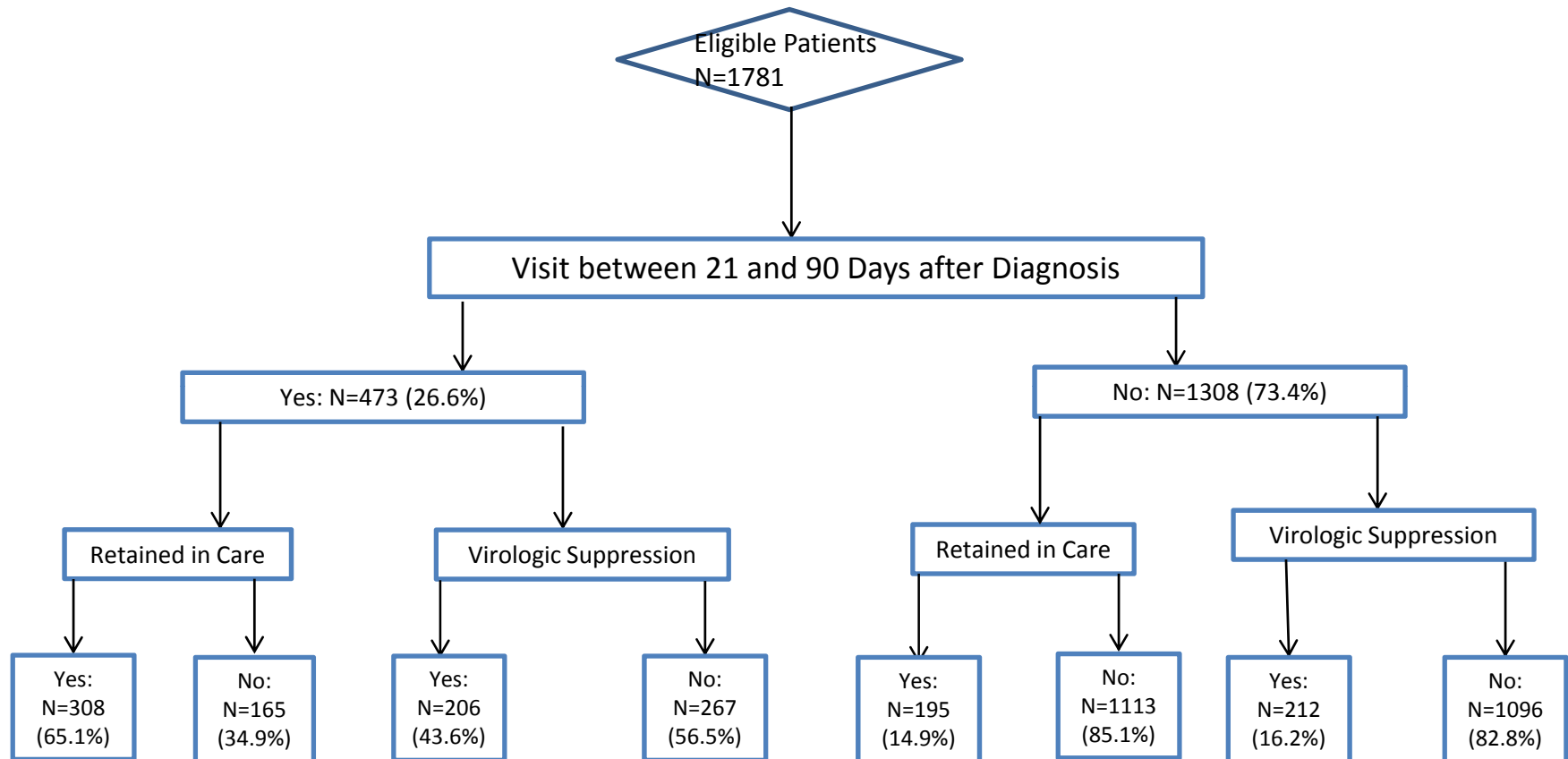
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S6. Flowsheet for Linkage Metric Clinic Visit between 21 and 60 Days after Diagnosis



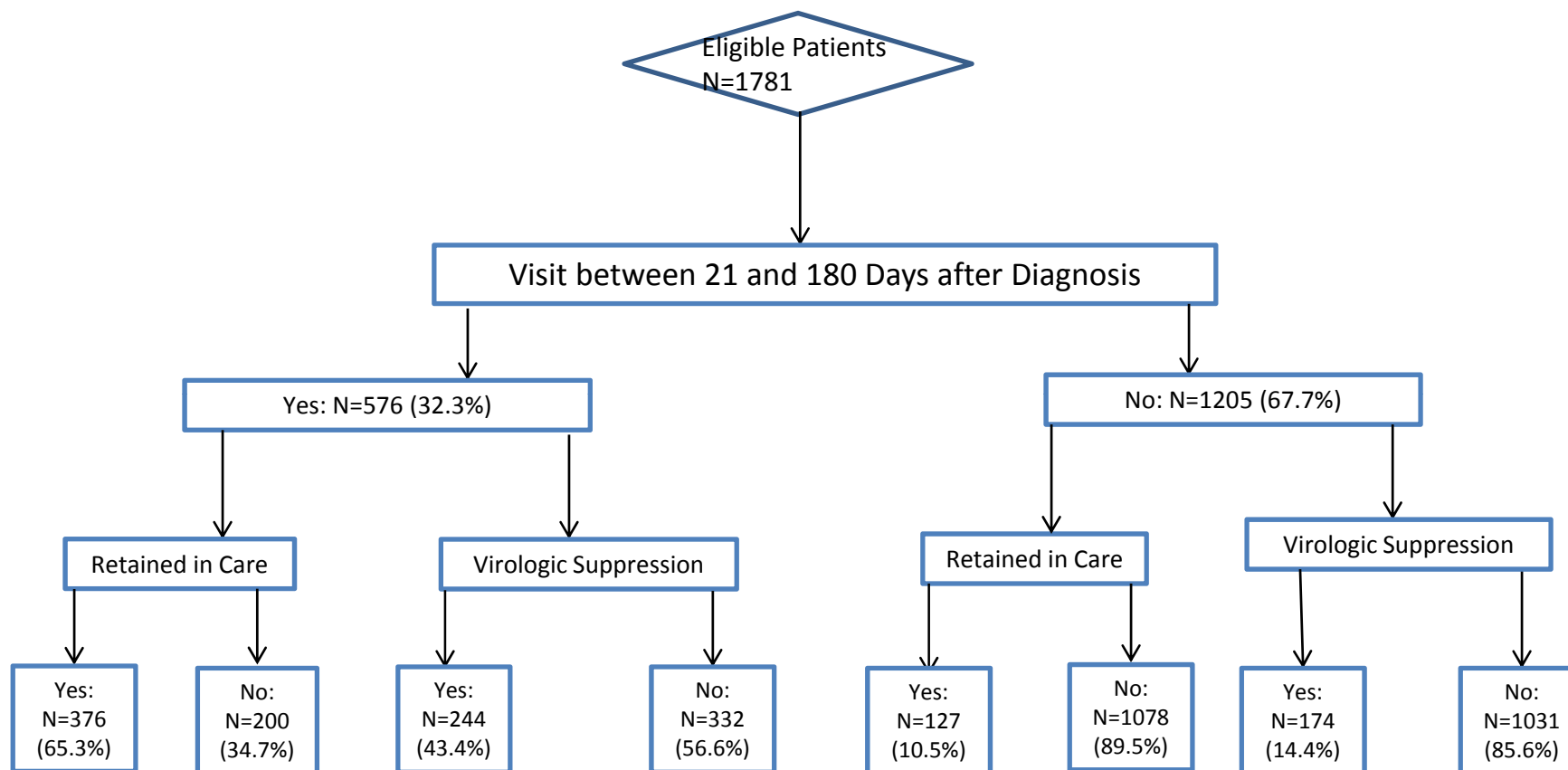
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S7. Flowsheet for Linkage Metric Clinic Visit between 21 and 90 Days after Diagnosis



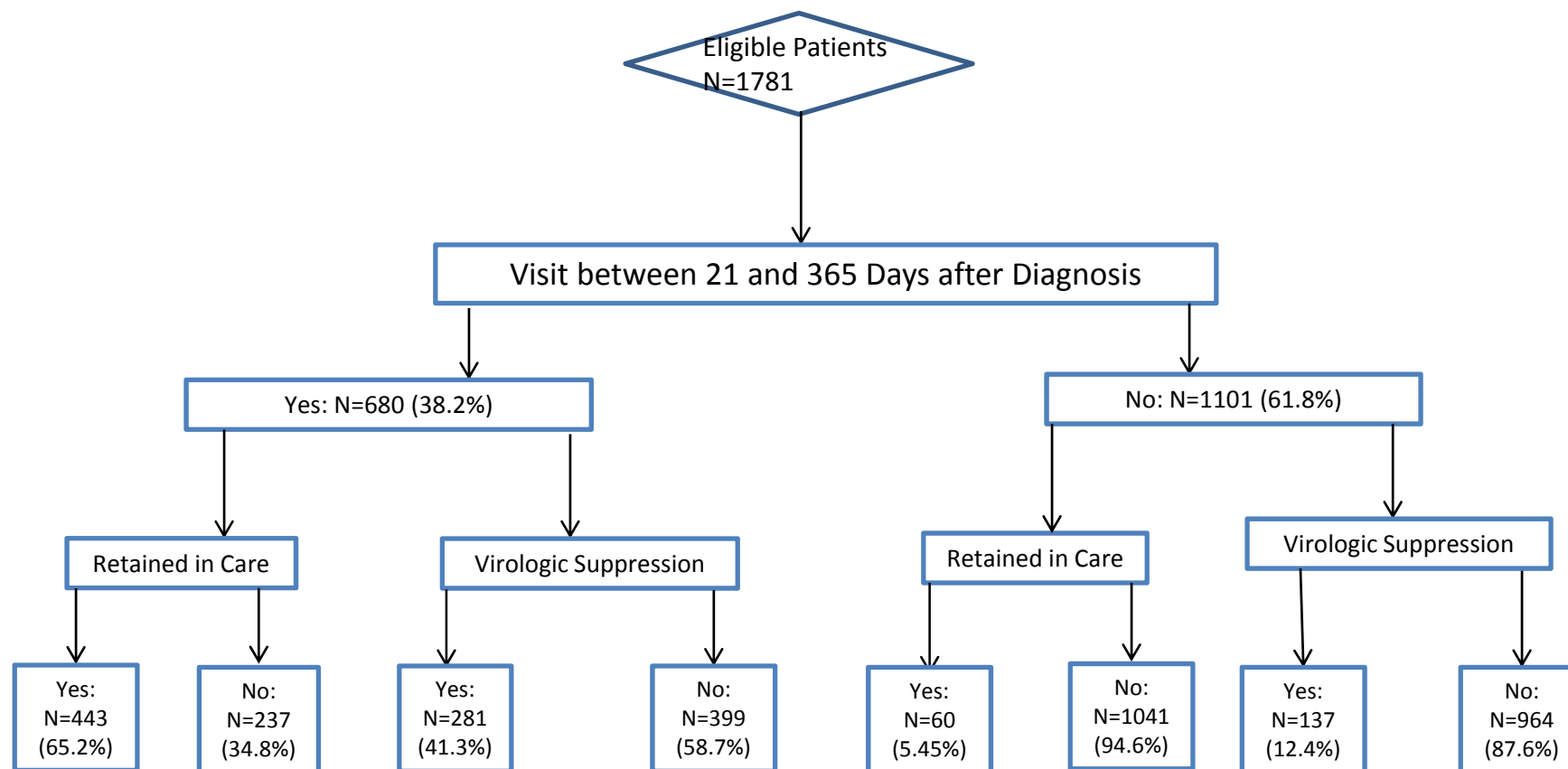
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S8. Flowsheet for Linkage Metric Clinic Visit between 21 and 180 Days after Diagnosis



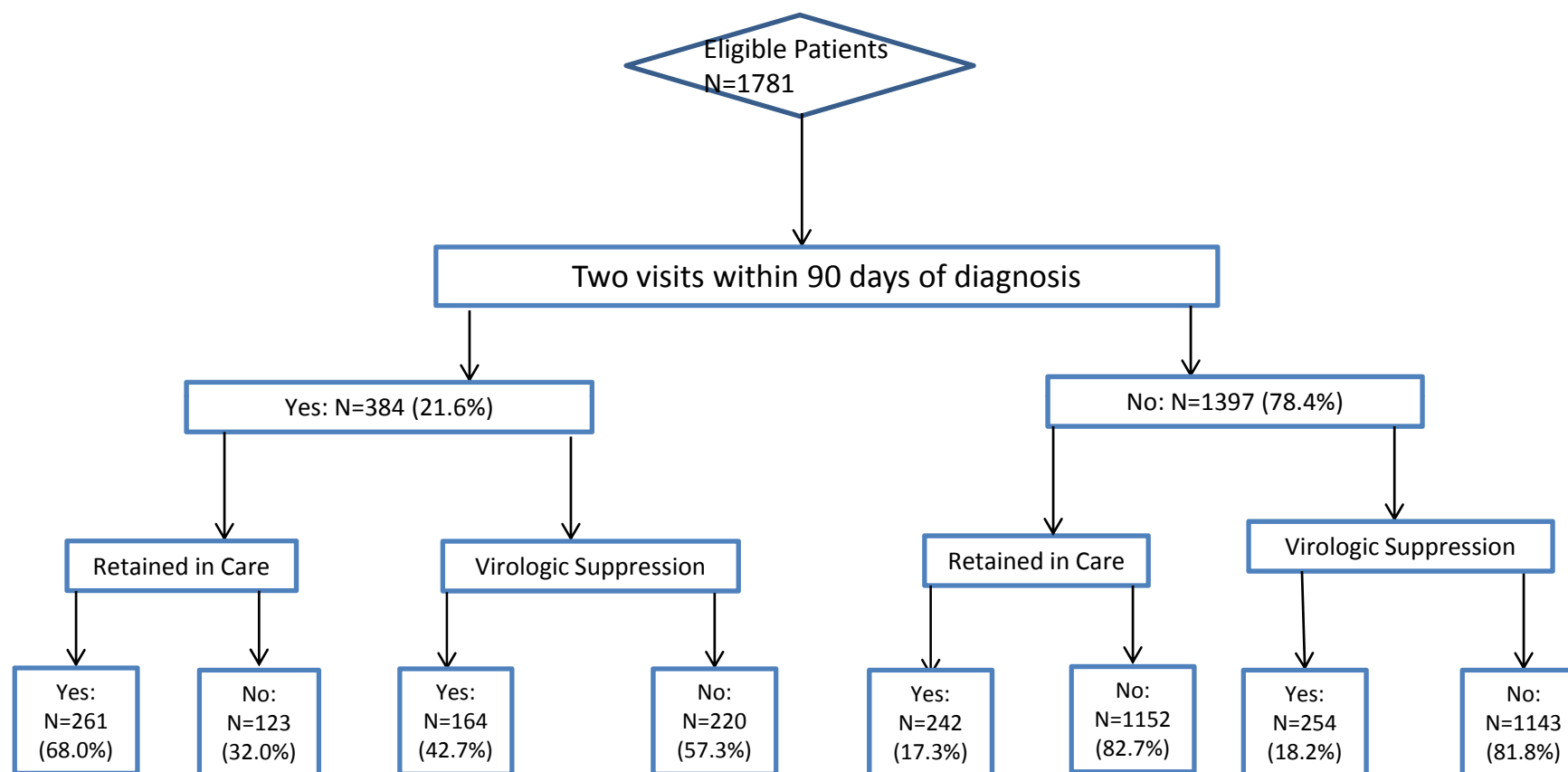
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S9. Flowsheet for Linkage Metric Clinic Visit between 21 and 365 Days after Diagnosis



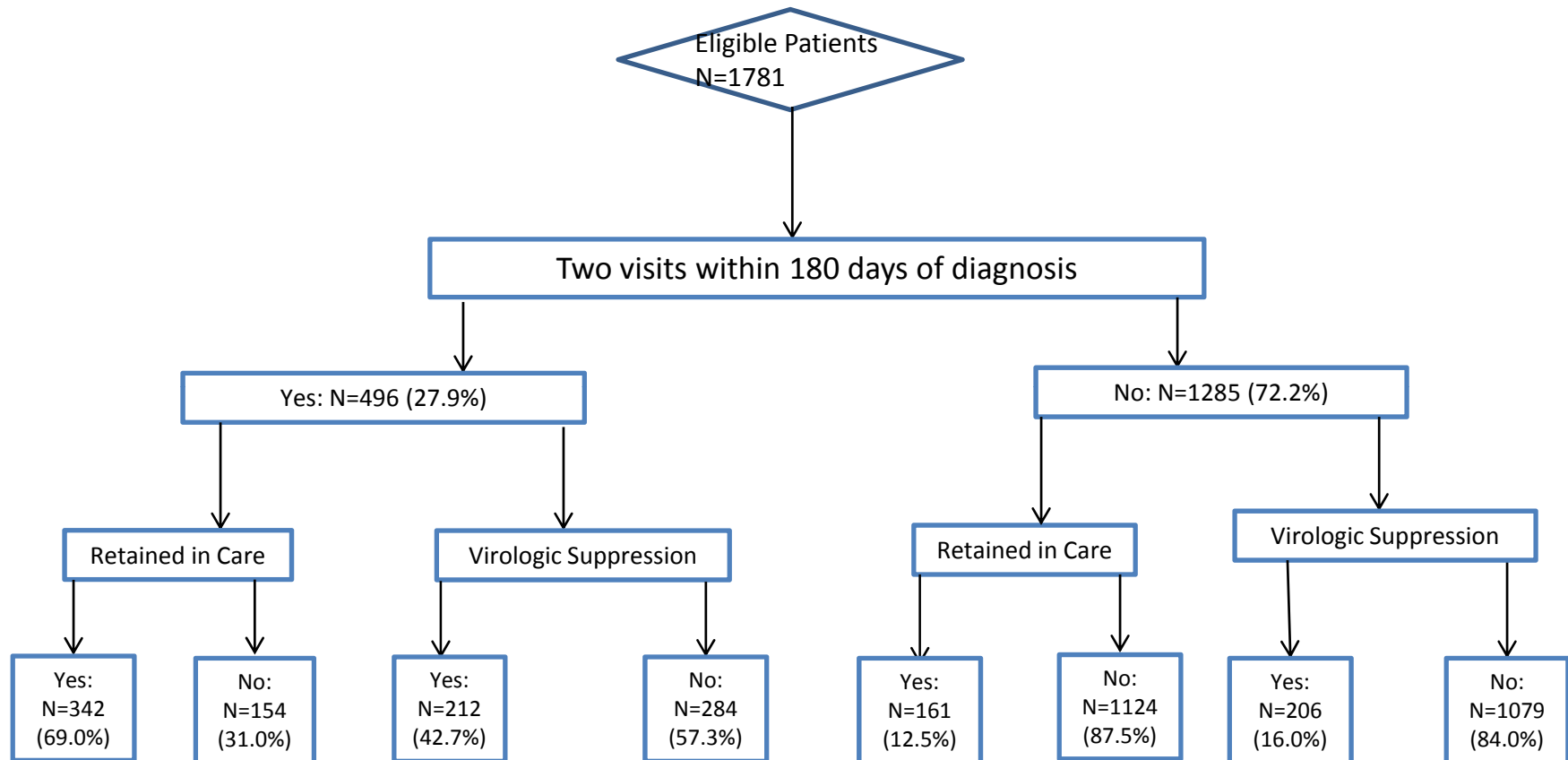
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S10. Flowsheet for Linkage Metric: 2 Clinic Visits within 90 Days of Diagnosis



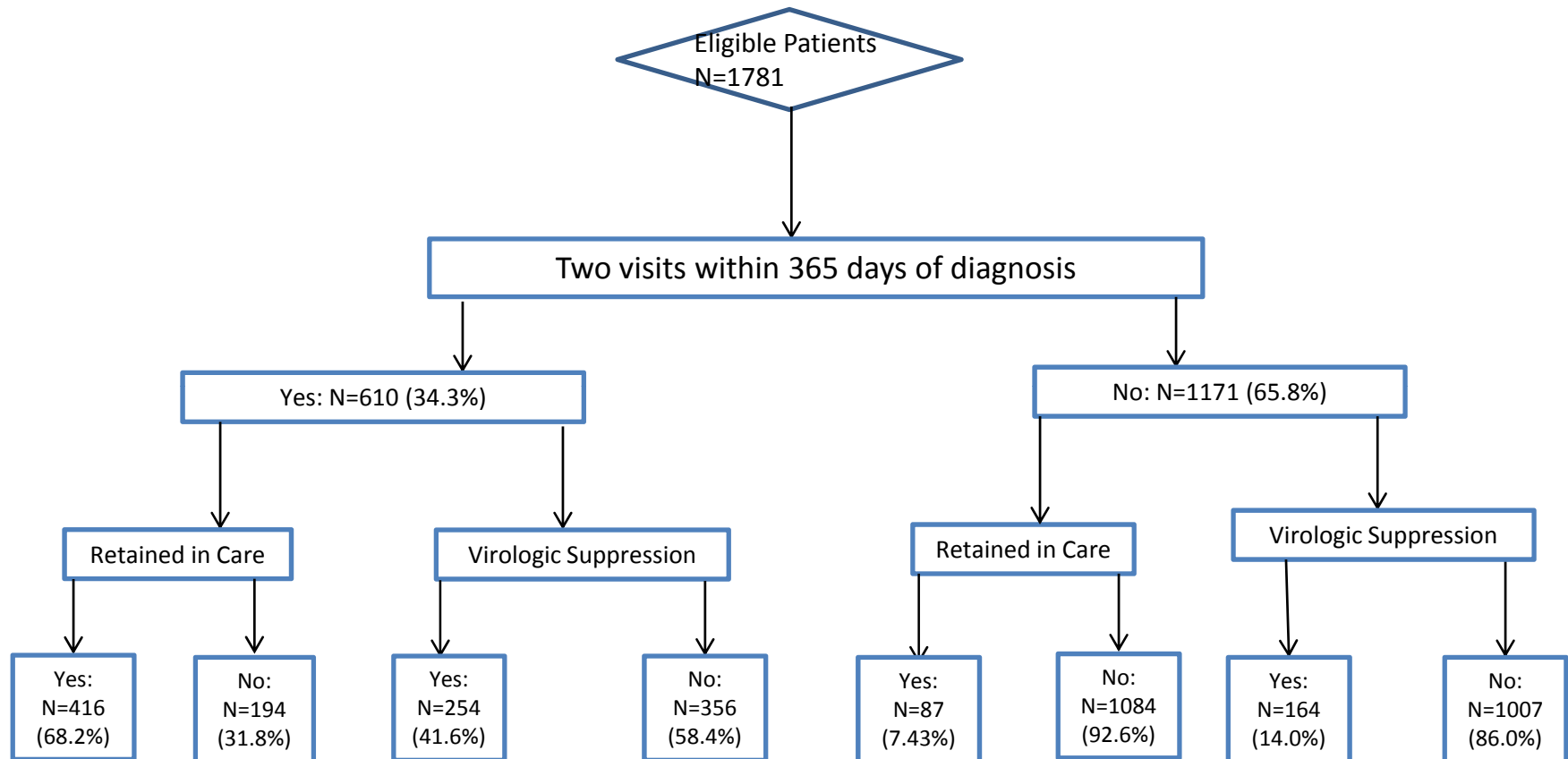
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S11. Flowsheet for Linkage Metric: 2 Clinic Visits within 180 Days of Diagnosis



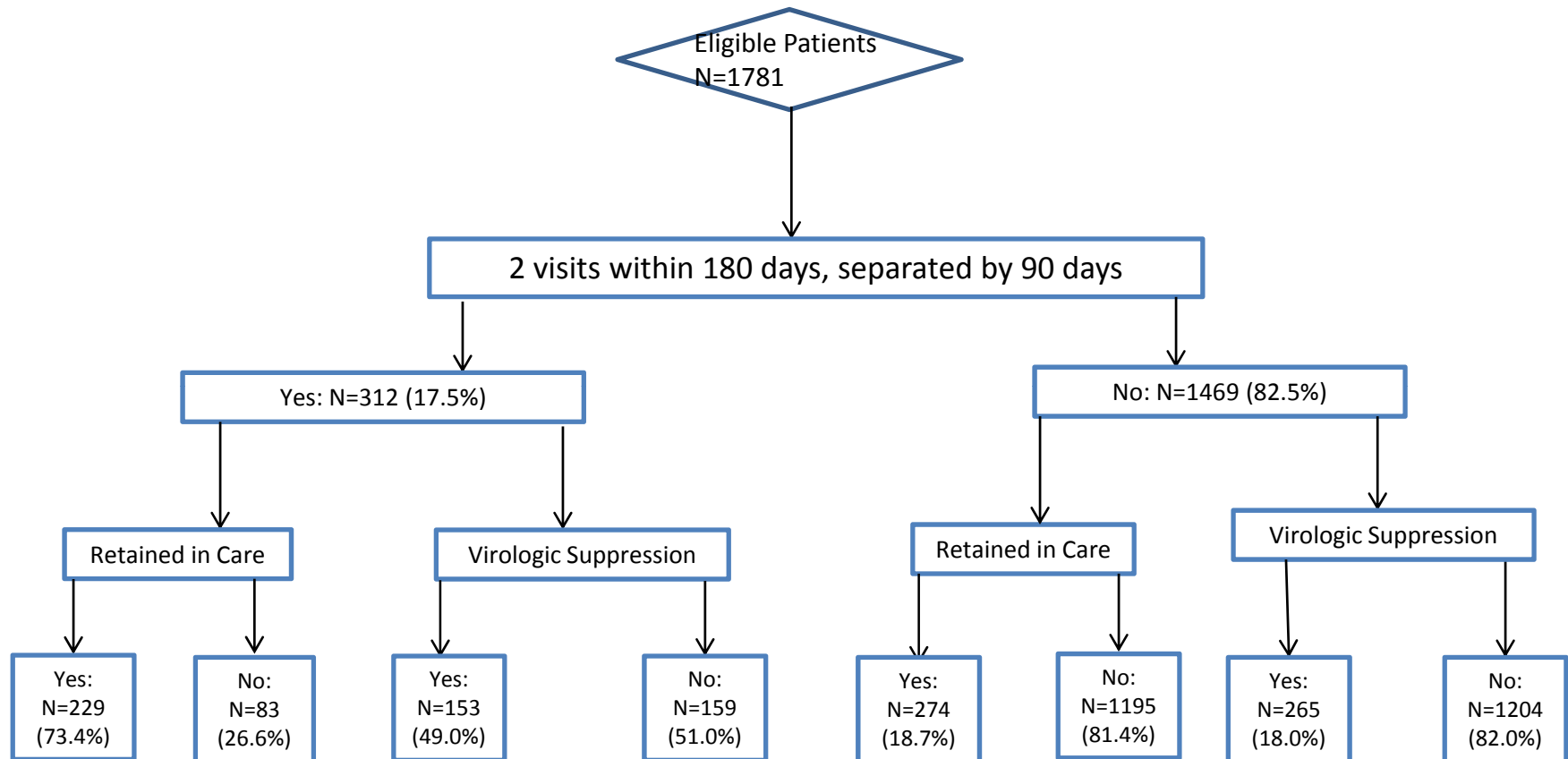
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Figure S12. Flowsheet for Linkage Metric: 2 Clinic Visits within 365 Days of Diagnosis



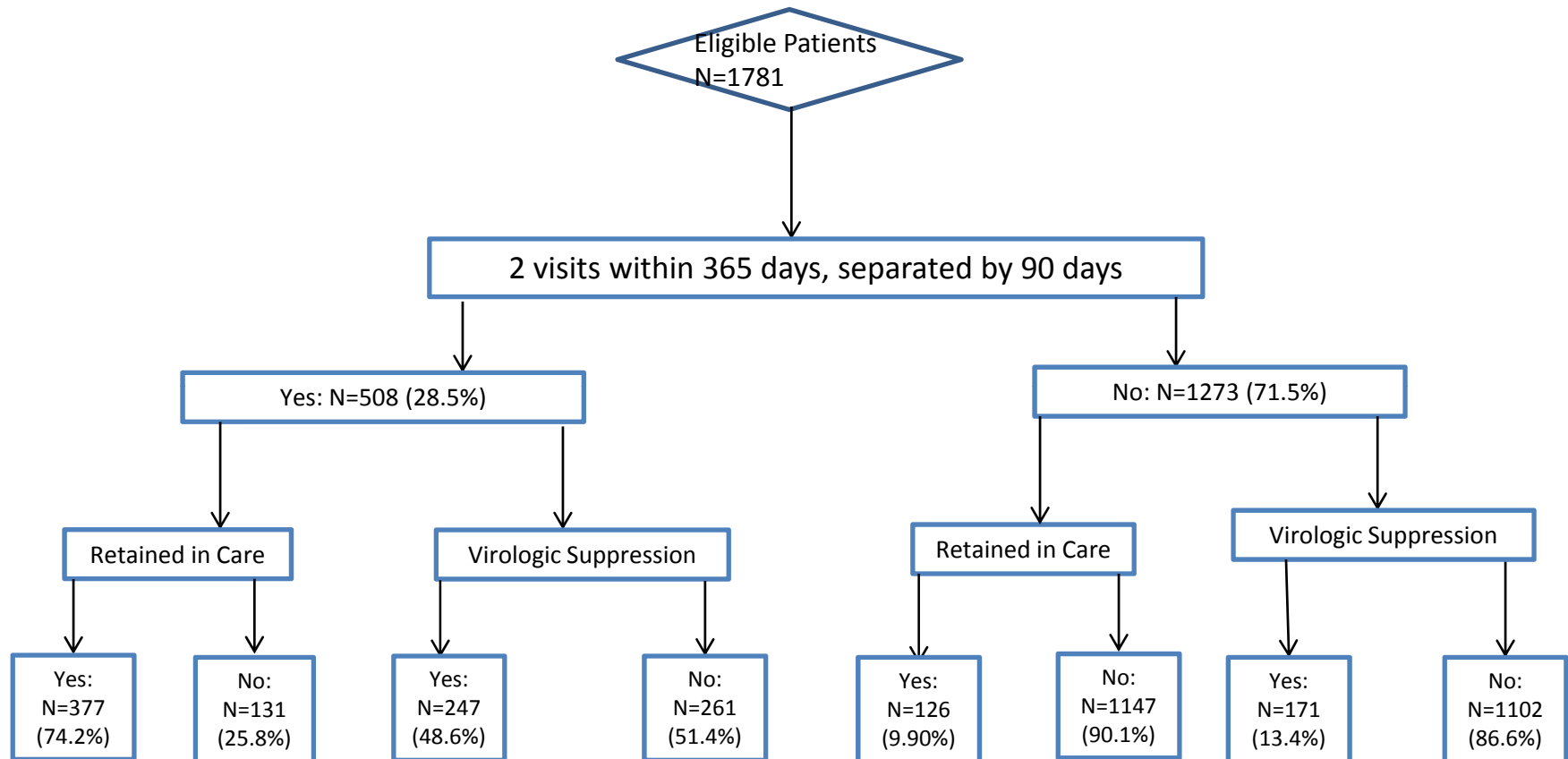
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S13. Flowsheet for Linkage Metric: 2 Clinic Visits within 180 Days of Diagnosis, Separated by 90 Days



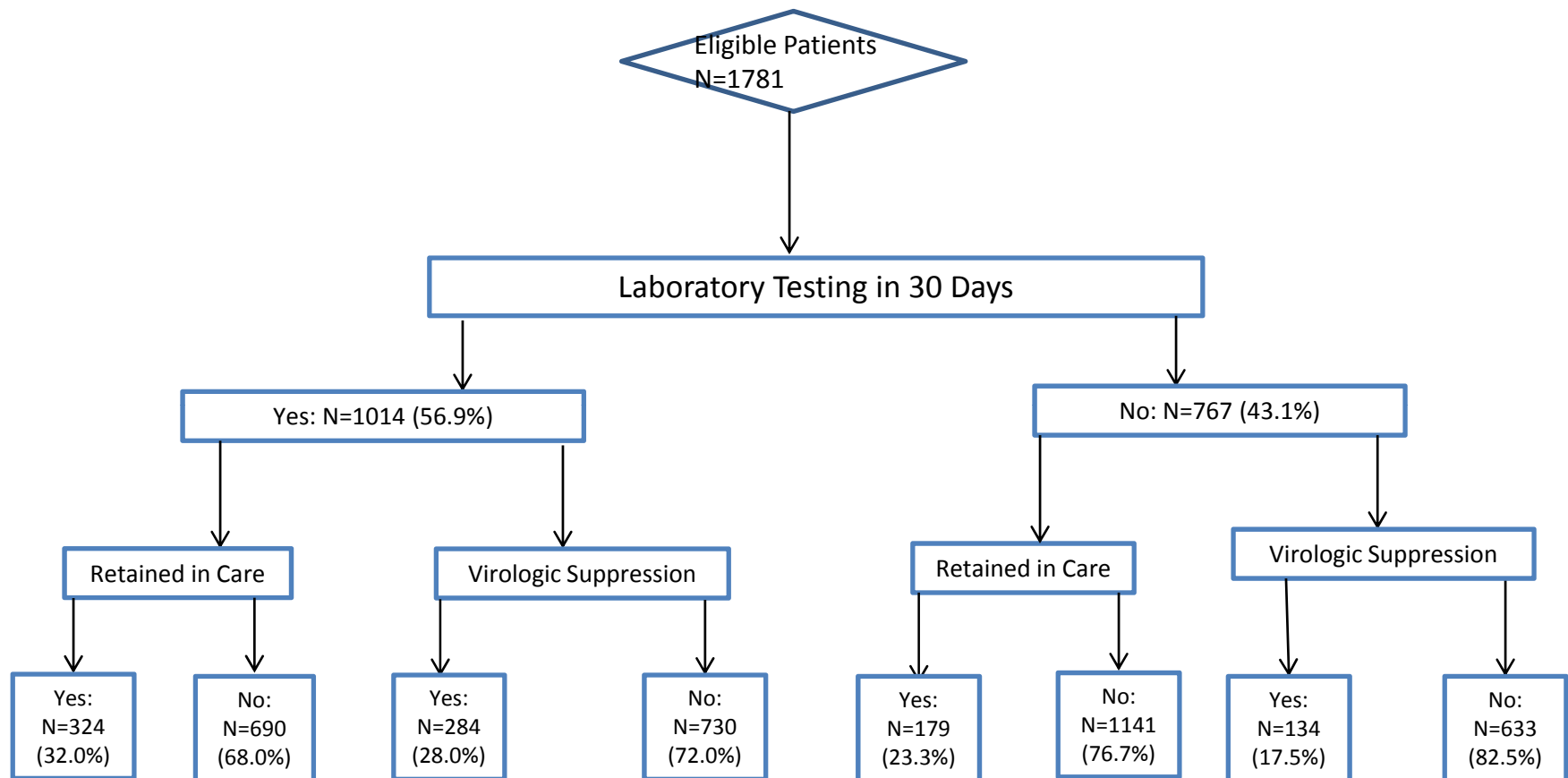
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S14. Flowsheet for Linkage Metric: 2 Clinic Visits within 180 Days of Diagnosis, Separated by 90 Days



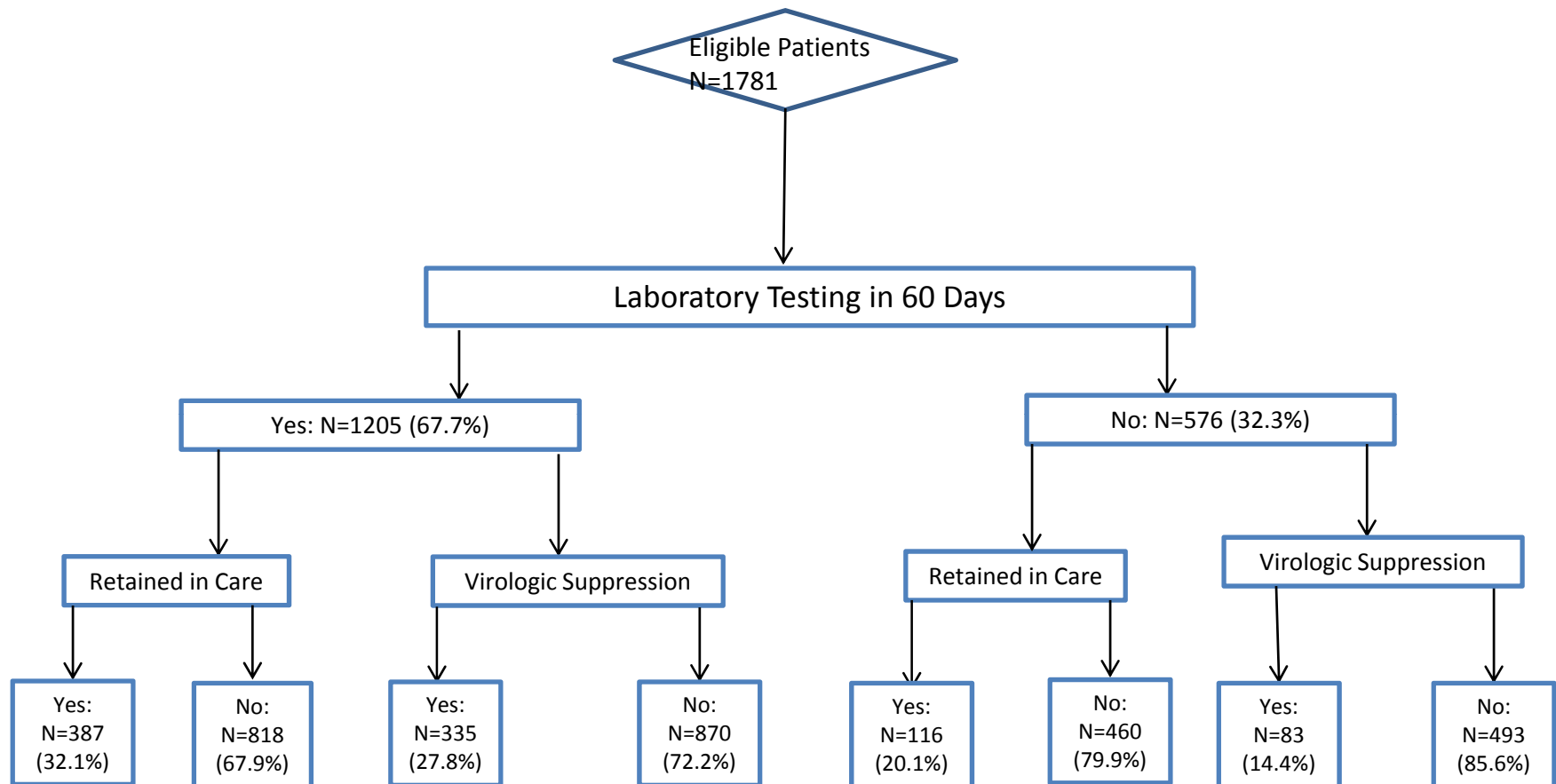
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S15. Flowsheet for Linkage Metric: Laboratory Testing in 30 Days of Diagnosis



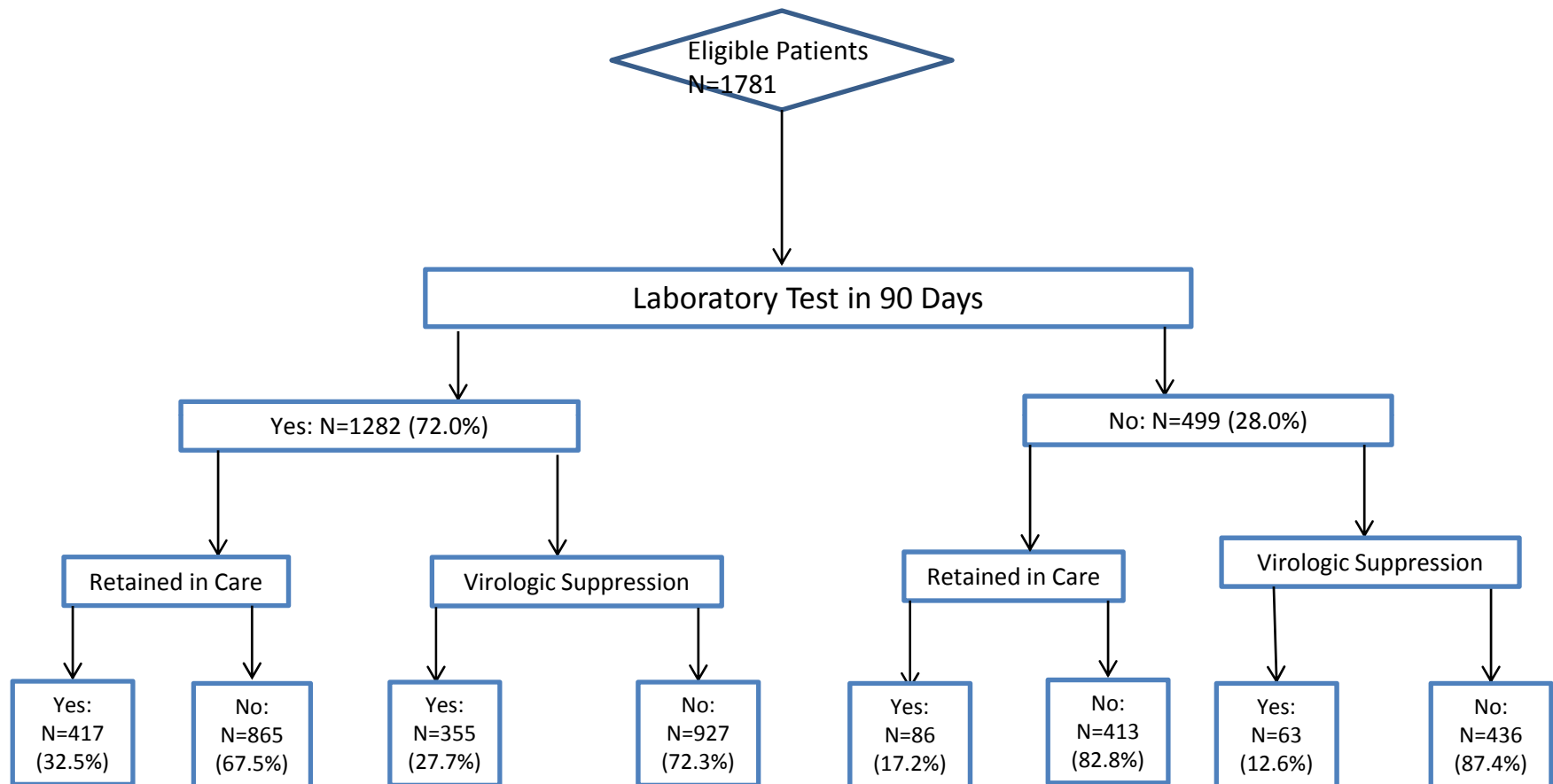
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Figure S16. Flowsheet for Linkage Metric: Laboratory Testing in 60 Days of Diagnosis



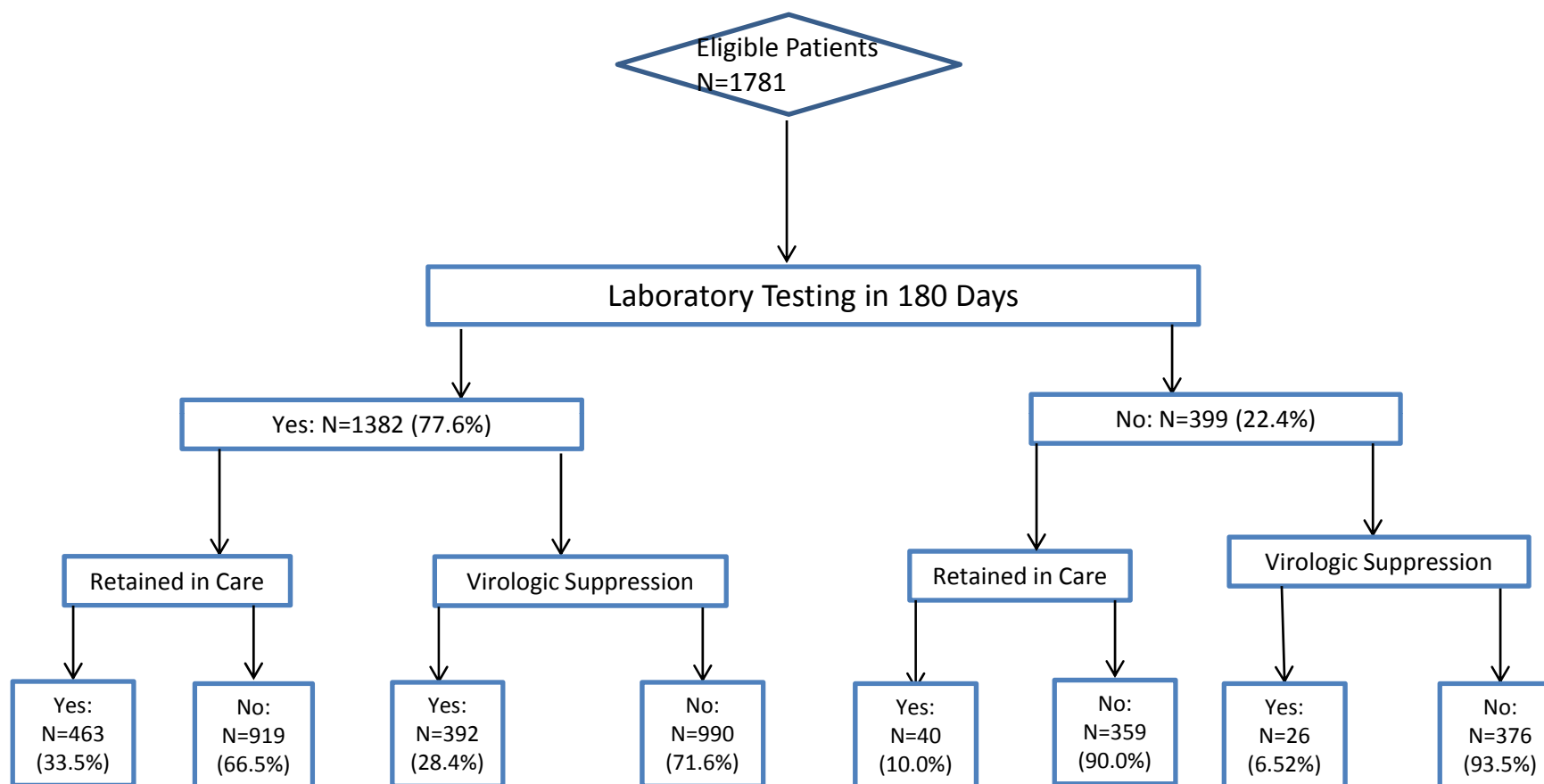
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Figure S17. Flowsheet for Linkage Metric: Laboratory Test in 90 Days of Diagnosis



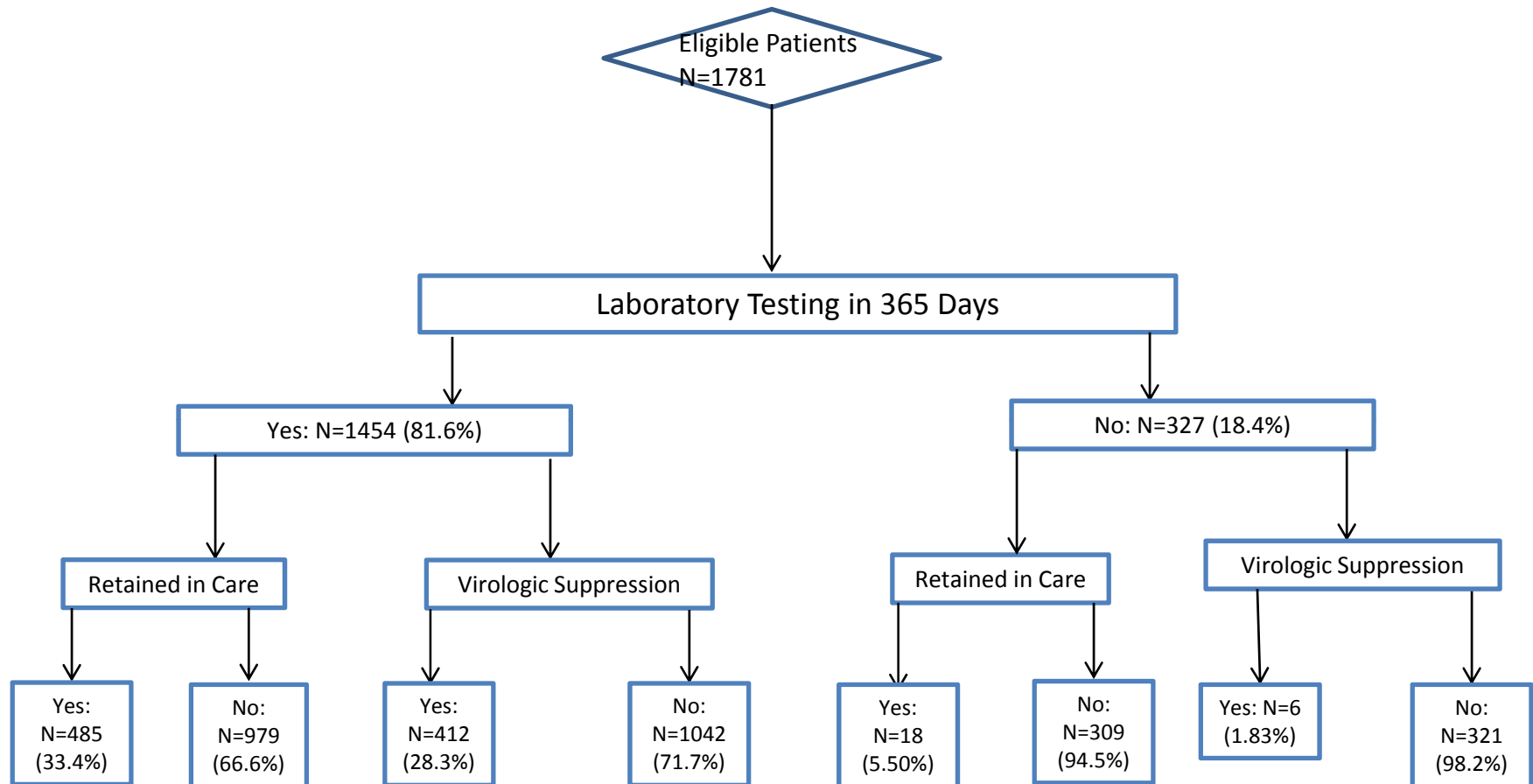
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Figure S18. Flowsheet for Linkage Metric: Laboratory Testing in 180 Days of Diagnosis



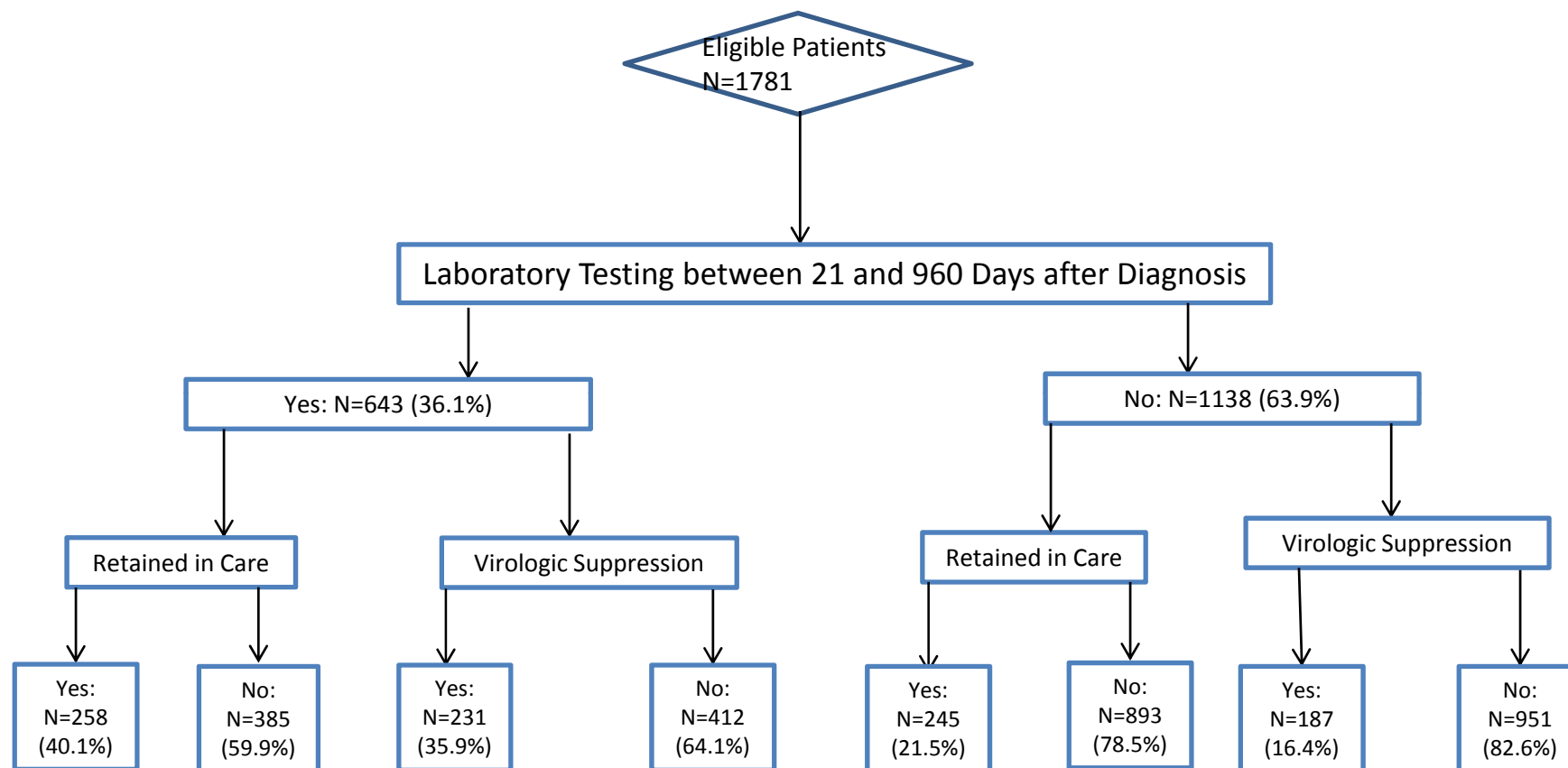
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S19. Flowsheet for Linkage Metric: Laboratory Testing in 365 Days of Diagnosis



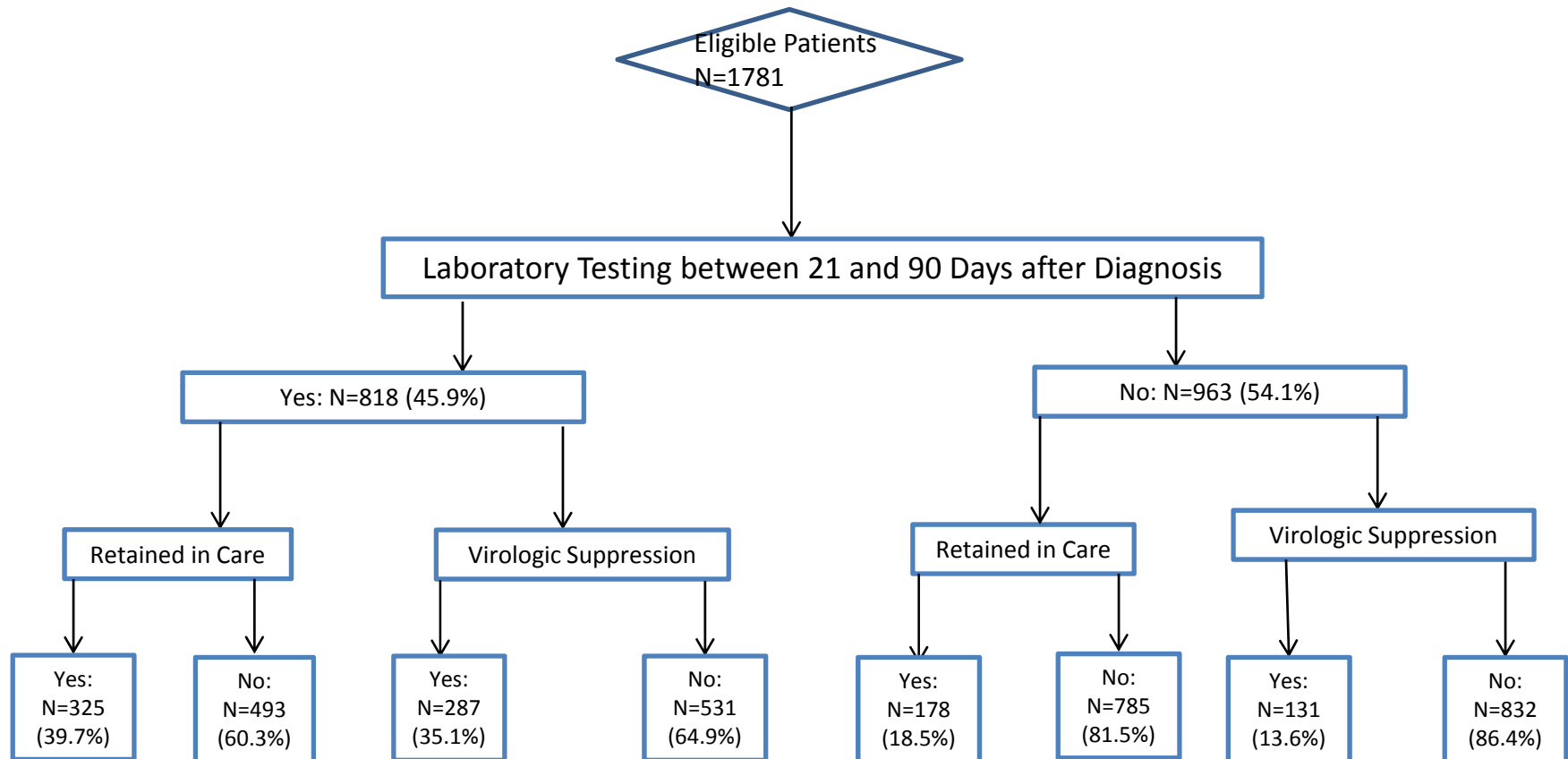
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S20. Flowsheet for Linkage Metric: Laboratory Testing between 21 and 60 Days after Diagnosis



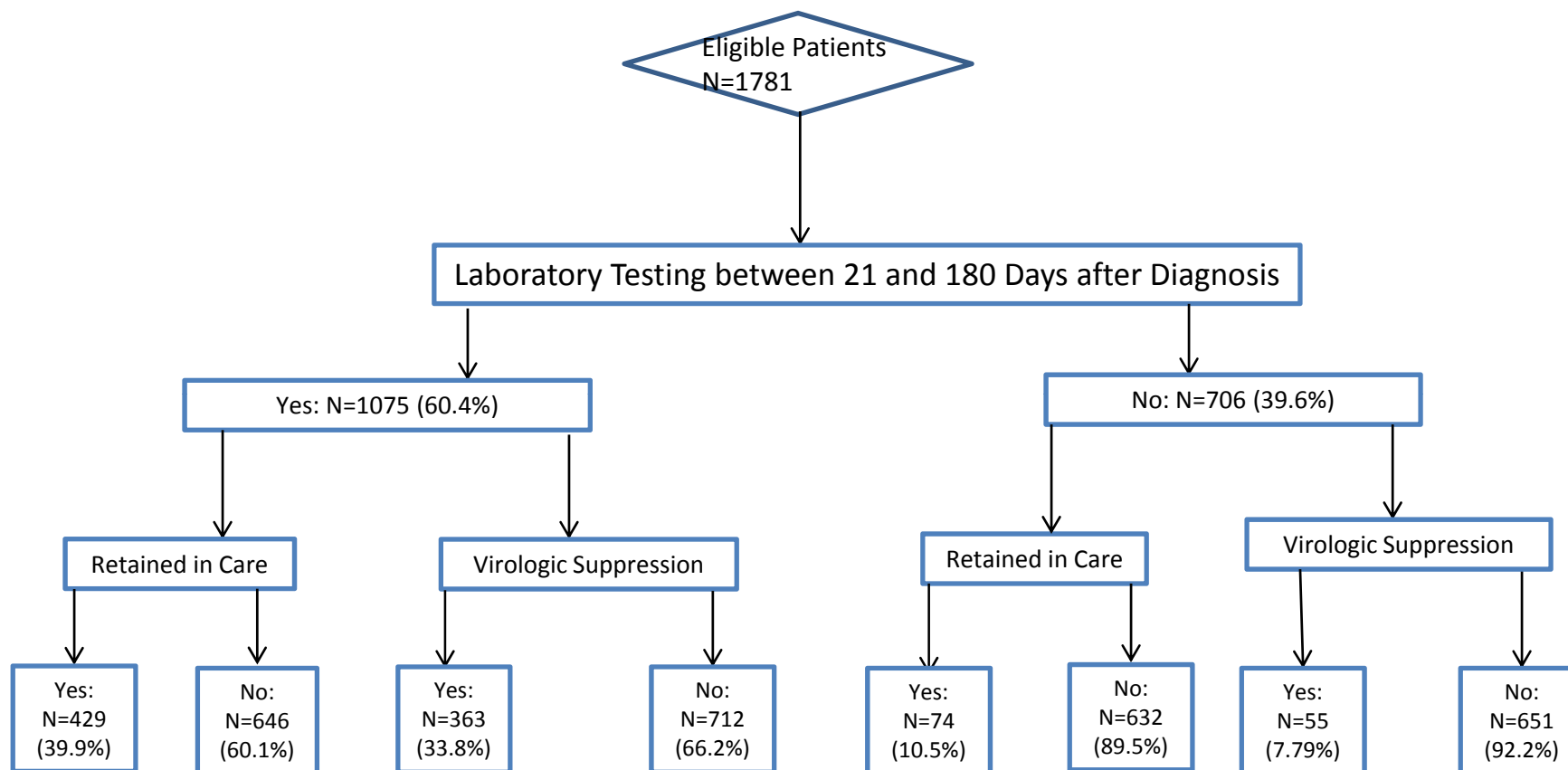
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S21. Flowsheet for Linkage Metric: Laboratory Testing between 21 and 90 Days after Diagnosis



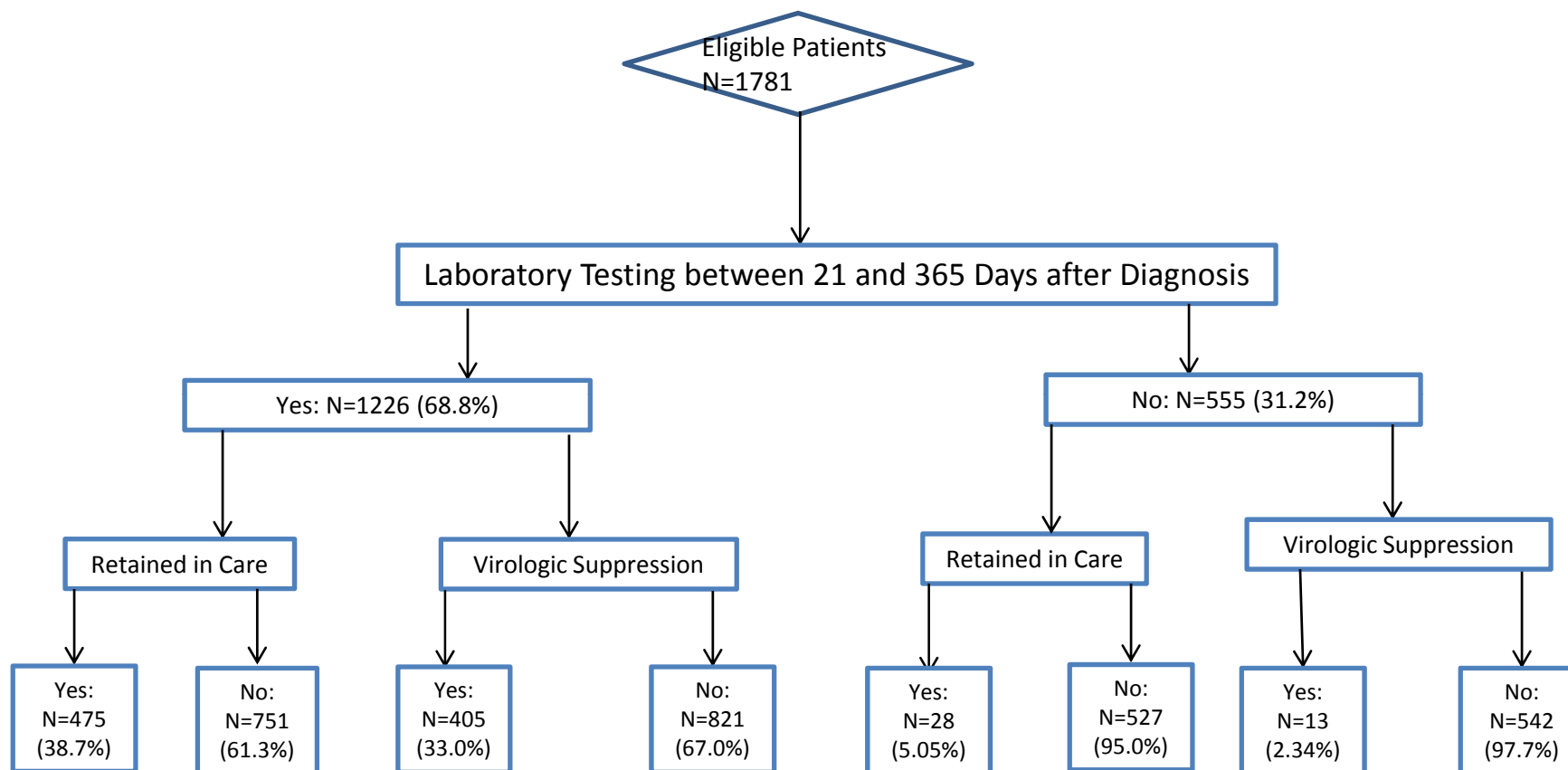
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S22. Flowsheet for Linkage Metric: Laboratory Testing between 21 and 180 Days after Diagnosis



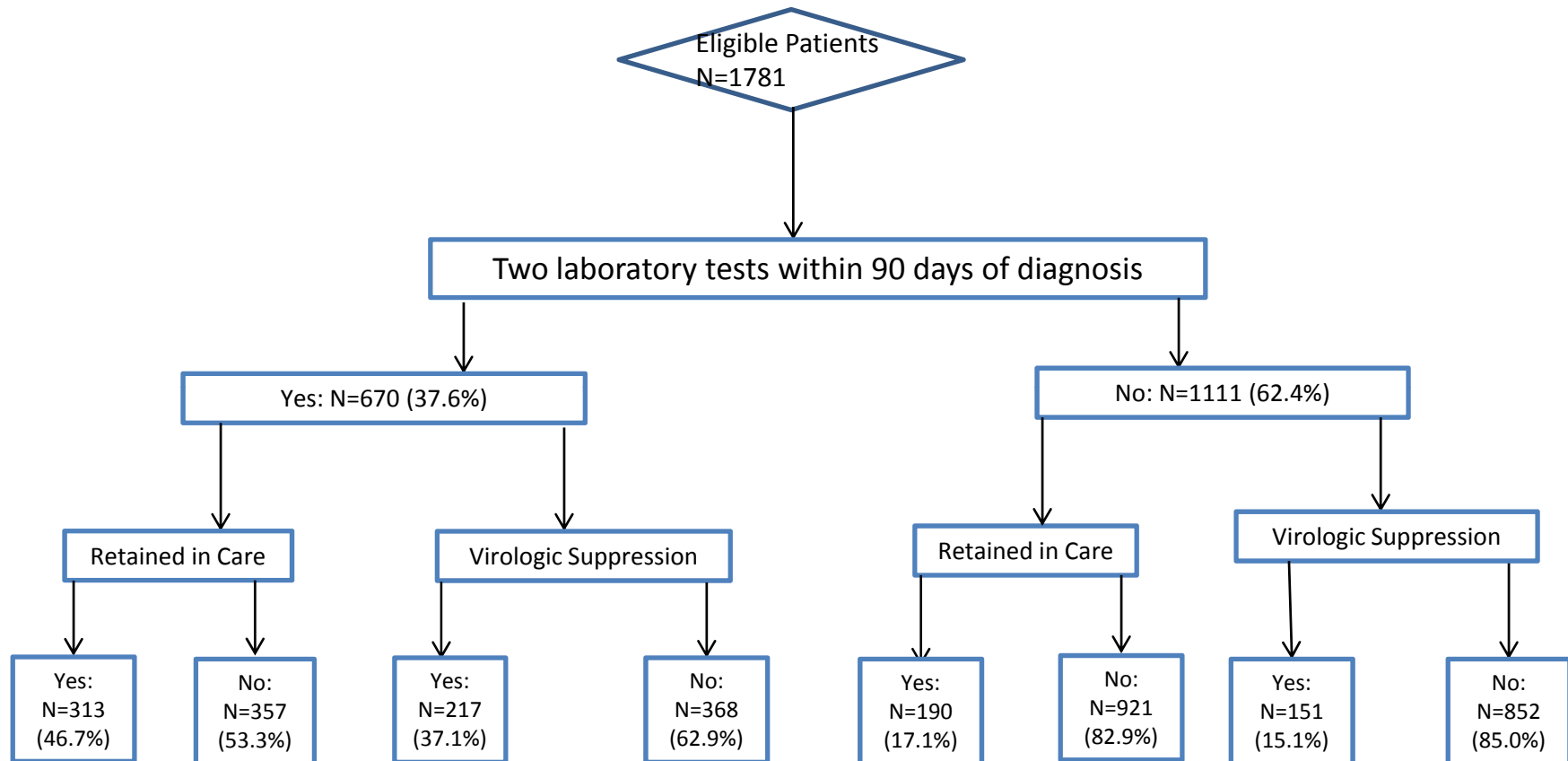
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S23. Flowsheet for Linkage Metric: Laboratory Testing between 21 and 365 Days after Diagnosis



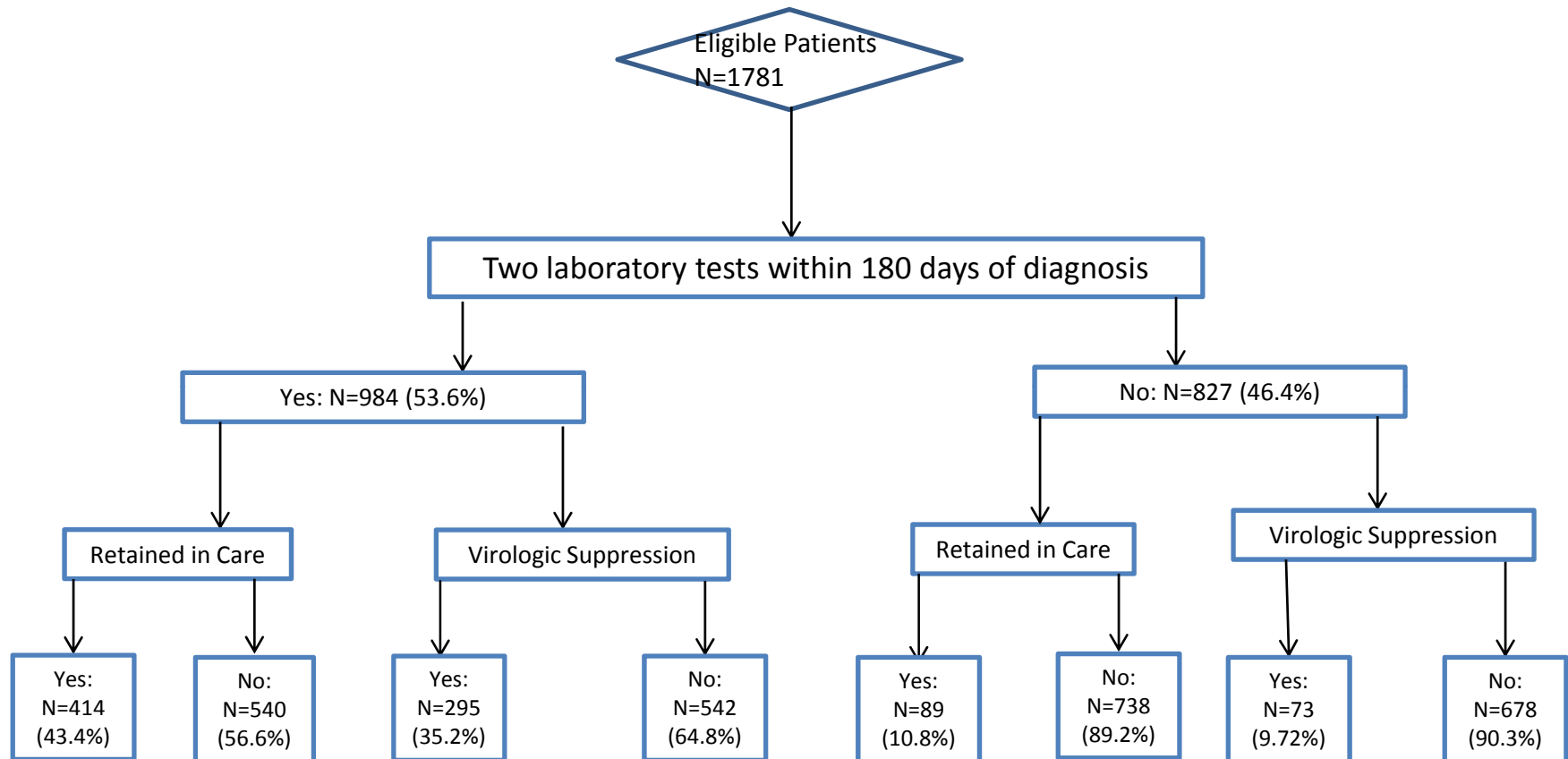
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S24. Flowsheet for Linkage Metric: 2 Laboratory Tests within 90 Days of Diagnosis



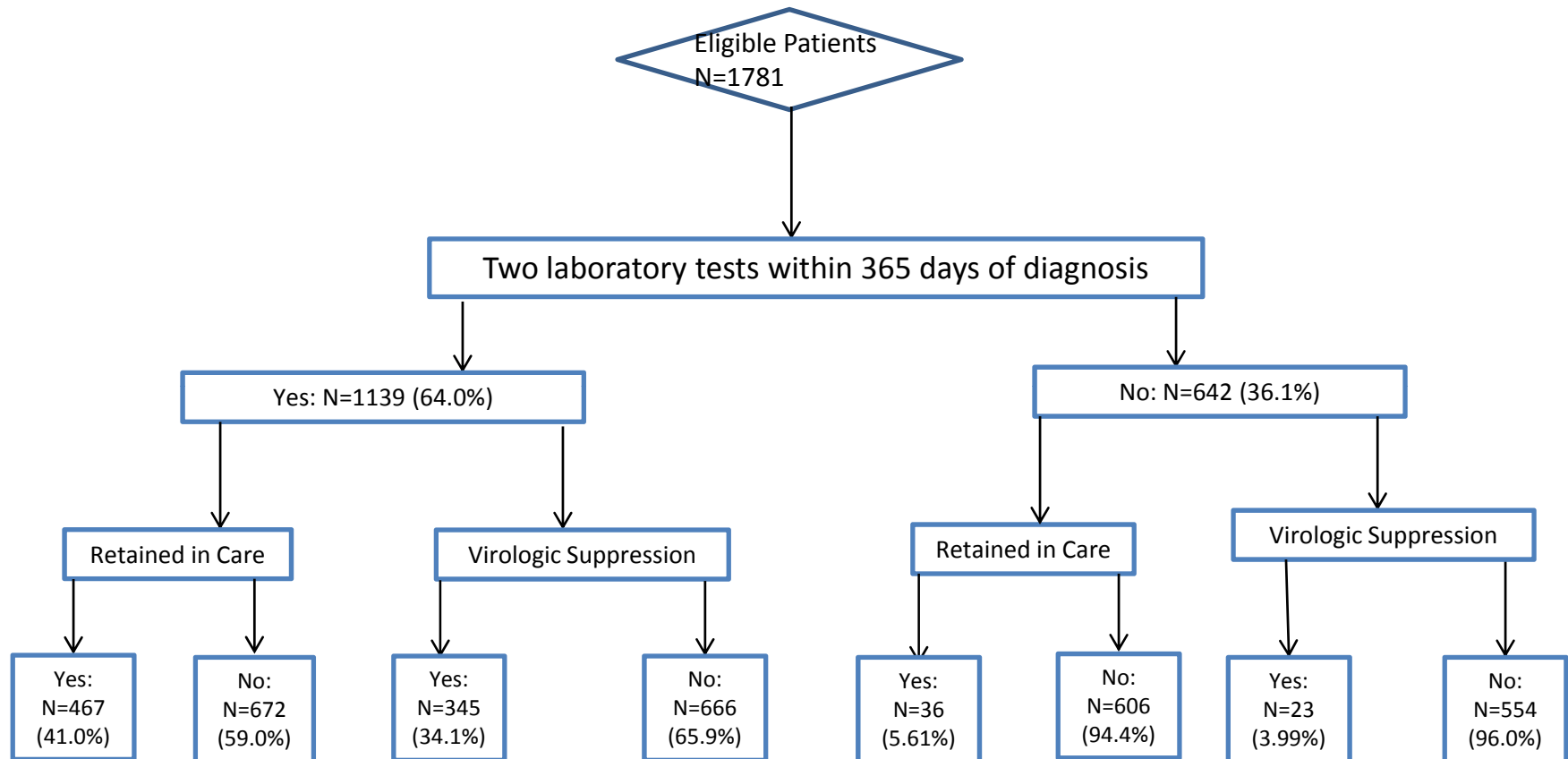
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S25. Flowsheet for Linkage Metric: 2 Laboratory Tests within 180 Days of Diagnosis



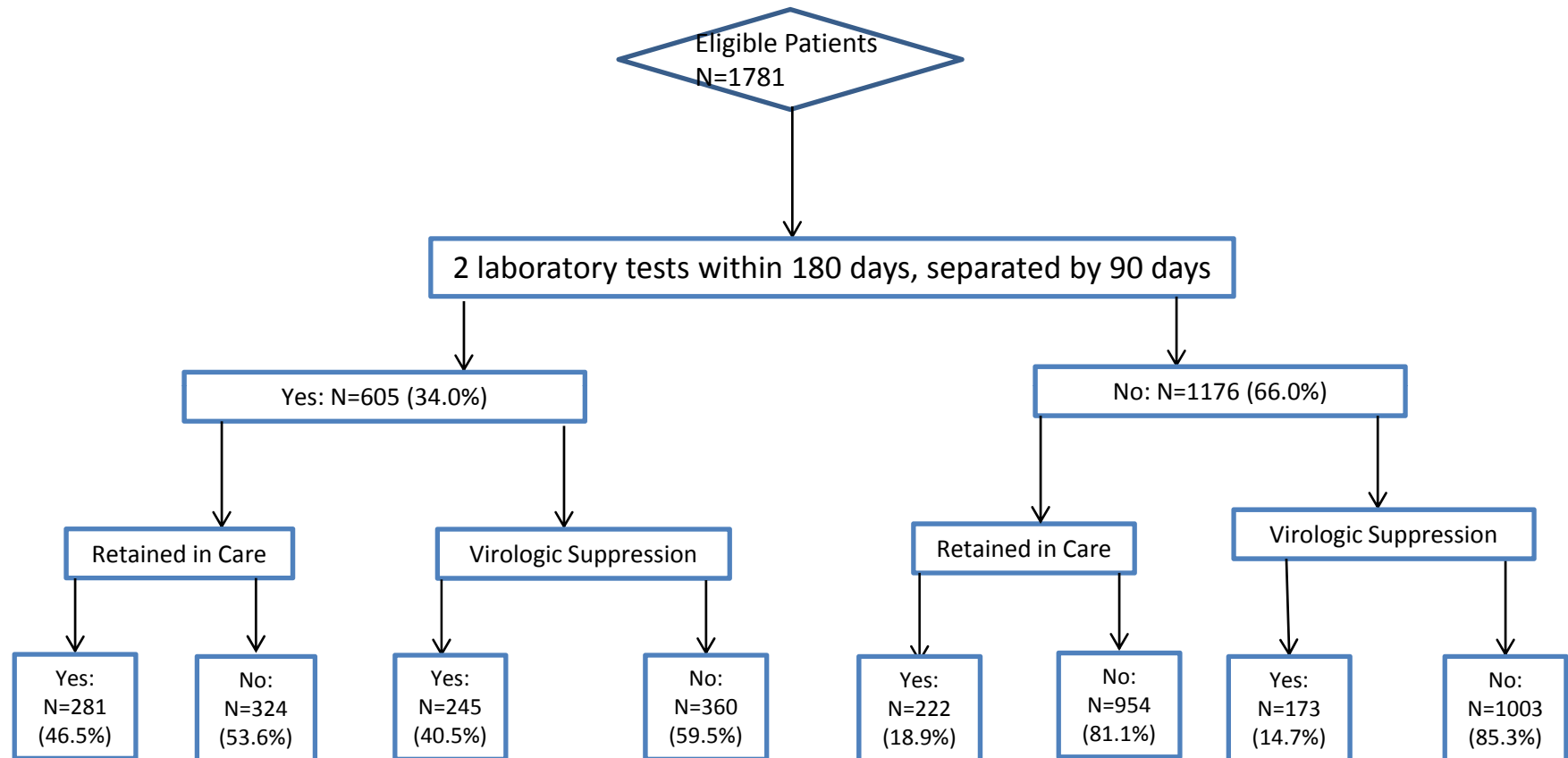
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S26. Flowsheet for Linkage Metric: 2 Laboratory Tests within 365 Days of Diagnosis



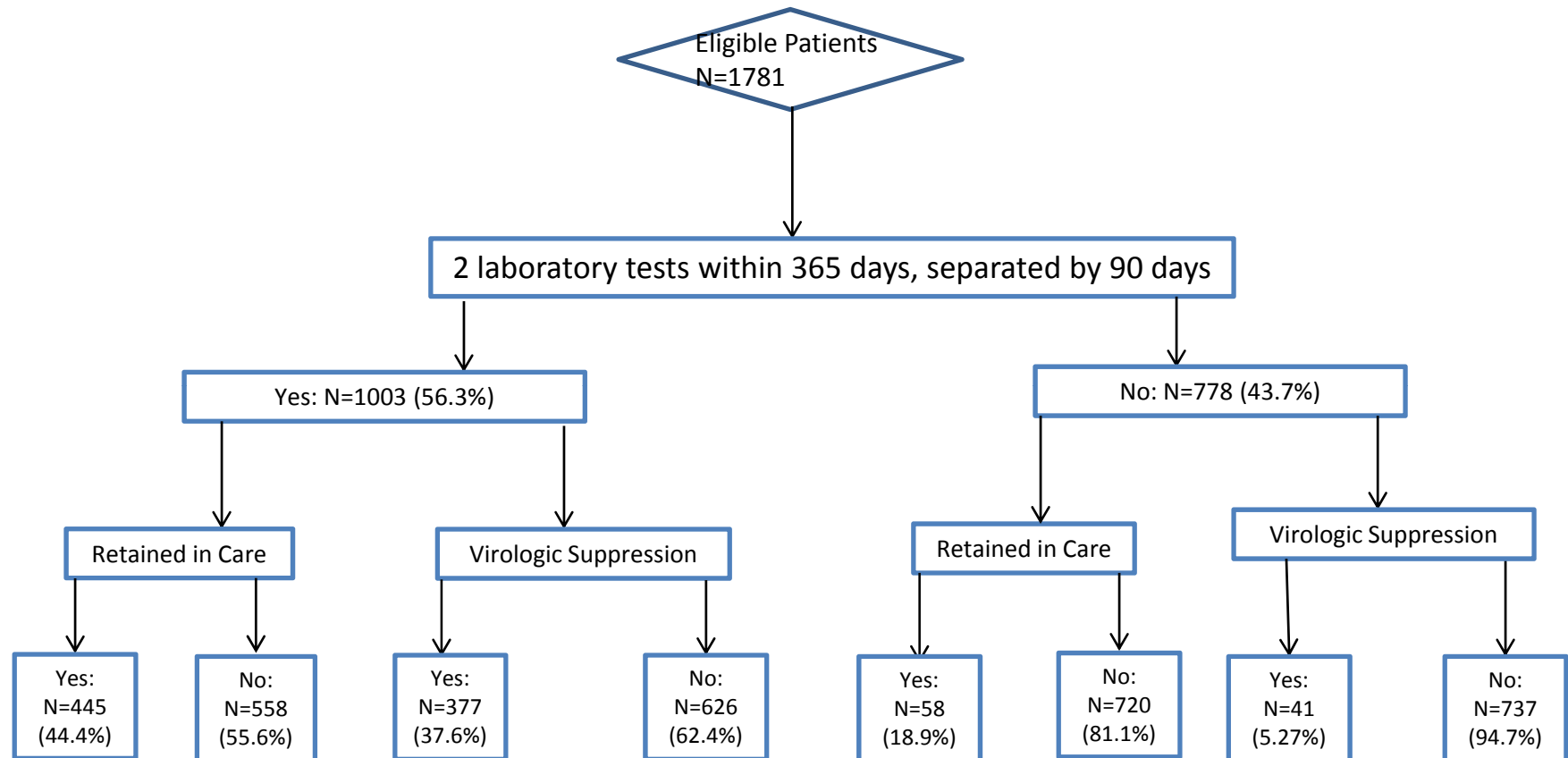
No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S27. Flowsheet for Linkage Metric: 2 Laboratory Tests within 180 Days of Diagnosis, Separated by 90 Days



No missing values were present for any index variables: missing values were assumed to have not met criteria.

Figure S28. Flowsheet for Linkage Metric: 2 Laboratory Tests within 365 Days of Diagnosis, Separated by 90 Days



No missing values were present for any index variables: missing values were assumed to have not met criteria.