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Integrated Data to Predict Chronic Absence in the Woodland Hills Public School District

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University of Pittsburgh

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This report addresses chronic absence in Woodland Hills Public School District and its association with student demographic variables, within-year move, Human Service variables, census tract variables, and house assessment data. Student files from the year of 2013 were combined with student records from DHS. The census tract data and housing information were integrated with student level data. Only students with valid total number of enrollment dates were included, resulting with 3260 students. The minimum number of enrollment dates is 53.

- Attendance rate was computed by summing excused and unexcused absences divided by enrollment days (i.e., (iExc + iUnexc)/iMemb).
- Dependent variables:
    - chronic absence – was created (No, < 10%; yes, ≥ 10%).
- Predictors of CART:
    - School data:
        - sex (0=male, 1=female),
        - Within school year move (defined as whether the student had a start date after 09/30)
        - Old for grade
    - Department of Human Service Data (all the following variables are binary; 1=yes, 0=no)
        - CYF (EVER IN Children, Youth, and Families Children)
        - DA (EVER IN Drug & Alcohol - CCBHO and County)
        - EI (EVER IN Early Intervention)
        - FSC (EVER IN Family Support Center)
        - HH (EVER IN Hunger and Homeless)
        - MH (EVER IN Mental Health - CCBHO and County)
        - MR (EVER IN Office of Mental Retardation and Developmental Disabilities)
        - HACP (EVER IN Housing Authority of City of Pittsburgh)
        - DPW: if any of Department of Public Welfare-FS, SSI, and TNF
        - JPO (Ever in JPO children): this is excluded for grades k-5.
    - Census Tract data
        - Median House Sale price of 2013
        - Percentage below poverty level
        - Percentage Black
        - sumoftotal (sum of total delinquency)
        - HsgAgeBefore1914_tract_CountOfma (number of parcels-structure built before 1914)
        - Tract ranking suburbs
            - RankSuburbs_Poverty_12
            - RankSuburbs_Poverty200_12
            - RankSuburbs_FHF_12
            - RankSuburbs_MaleLF_12
            - RankSuburbs_Vacant_12
            - RankSuburbs_NoVehicle_12
            - RankSuburbs_Dropout_12
            - RankSuburbs_Sum

    - House assessment data
        - Homestead status
- Three different types of analyses were performed for each grade:
    - ***Section 1: Bivariate relationship*** between chronic absence and other variables were examined using t-test (for continuous variables) and two-way chi-square (for dichotomous variables).
    - ***Section 2: Binary logistic regression*** was performed predicting chronic absence by the aforementioned predictors.
    - ***Section 3: Classification and tree analysis*** (CART) is a data mining method to determine important predictors of categorical dependent variable using a non-parametric iterative process. Unlike logistic regression, CART examines interactions among predictors. CART was performed for the outcome variable Chronic Absence for subjects by each grade.
- There is no missing data on these variables.

1. Bivariate relationship

1.1 Description of house parcel and census tract variables

There are 1909 house parcels and 44.53% is homestead. There are 19 census tracts from which Clairton students were from.

Table 1 presents descriptive statistics of census tract variables over 19 census tracts from which Clairton students were from.

Table 1. Descriptive statistics of census tract variables measured at tract level (N=19)

	Minimum	Maximum	Mean	Std. Deviation
Sum Of Total Delinquency	4440.90	54248.49	26502.84	12372.93
HsgAgeBefore1914_tract_CountOfma	4.00	582.00	234.47	154.52
Tract2013_MEDIAN_of_SalePrice	7025.00	210000.00	64976.97	61582.01
percent_poverty	3.10	44.20	19.19	12.03
percent_black	0.03	0.22	0.08	0.04
RankSuburbs_Poverty_12	55.00	262.00	193.63	65.41
RankSuburbs_Poverty200_12	23.00	264.00	177.79	75.91
RankSuburbs_FHF_12	49.00	262.00	189.58	60.96
RankSuburbs_MaleLF_12	51.00	262.00	189.58	62.00
RankSuburbs_Vacant_12	29.00	263.00	191.79	70.00
RankSuburbs_NoVehicle_12	3.00	259.00	179.74	78.44
RankSuburbs_Dropout_12	1.00	264.00	110.95	119.85
RankSuburbs_Sum	356.00	1800.00	1233.05	409.84

1.2 Description of student-level variables by chronic absence

Bivariate relationship between chronic absence and other variables were examined using t-test (for continuous variables) and two-way chi-square (for dichotomous variables). Effect sizes (Point-Biserial correlation for continuous variables and Cramer's V for dichotomous variables) was examined in order to determine meaningfulness of results. Cramer's V and point-biserial correlation are on the same metric as correlation coefficient (small, 10-.30; medium, .30-.50; large, >.50).

Table 2. Bivariate association between attendance group and predictors—Kindergarten (N=342)

	Non-Chronic absent 75.10%		Chronic absent 24.90%		Correlation
	Proportion		Proportion		
Female	0.52		0.40		.10
old for grade	0.05		0.09		.09
School Move	0.08		0.16		.12*
CYF	0.13		0.26		.153**
DA	0.00		0.00		NA
MH	0.05		0.11		.10
EI	0.07		0.20		.18***
FSC	0.12		0.16		.06
HH	0.05		0.07		.05
MR	0.00		0.00		na
JPO	0.00		0.00		na
DPW	0.15		0.19		.04
HACP	0.03		0.04		.01
homestead	0.31		0.19		.12*
	M	SD	M	SD	
Sum of Total Delinquency in 2013	30620.36	13550.18	26645.52	15013.96	0.123*
Number of parcels-structure built before 1914	269.00	145.42	308.72	124.90	0.122*
Medium house sales price in 2013	41525.39	41522.34	26465.00	29900.39	0.165**
% below poverty level	22.88	12.06	26.75	11.00	0.141**
% black	0.09	0.04	0.10	0.04	0.173***
Tract ranking Poverty	212.35	52.98	235.02	28.64	0.2***
Tract ranking Poverty200	200.62	59.29	227.36	32.69	0.21***
Tract ranking FHF	209.96	45.16	225.73	34.98	0.157**
Tract ranking MaleLF	204.76	53.17	228.31	34.38	0.203***
Tract ranking Vacant	215.87	55.09	235.07	38.12	0.16**
Tract ranking NoVehicle	198.87	66.00	219.98	50.11	0.145**
Tract ranking Dropout_12	120.28	116.28	143.61	112.38	0.087
RankSuburbs_Sum	1362.71	333.93	1515.08	259.87	0.204***

Table 3. Bivariate association between attendance group and predictors—Grade 1 (N=319)

	Non-Chronic absent 77.70%		Chronic absent 22.30%		Correlation
	Proportion		Proportion		
Female	0.48		0.48		.004
old for grade	0.07		0.14		.10
School Move	0.05		0.21		.23***
CYF	0.15		0.34		.21***
DA	0.00		0.00		NA
MH	0.11		0.10		.01
EI	0.08		0.11		.05
FSC	0.08		0.28		.25***
HH	0.06		0.10		.05
MR	0.00		0.00		na
JPO	0.00		0.00		na
DPW	0.19		0.35		.16**
HACP	0.02		0.01		.02
homestead	0.34		0.11		.21***
	M	SD	M	SD	
Sum of Total Delinquency in 2013	30693.08	13831.98	28488.73	15473.95	0.065
Number of parcels-structure built before 1914	261.59	143.35	298.25	127.73	0.109
Medium house sales price in 2013	42488.76	40278.94	33099.65	39970.22	0.097
% below poverty level	22.53	11.42	27.29	11.39	0.172**
% black	0.08	0.04	0.10	0.05	0.149**
Tract ranking Poverty	213.33	50.42	232.27	40.27	0.161**
Tract ranking Poverty200	200.51	56.73	220.48	49.07	0.149**
Tract ranking FHF	205.04	48.78	219.54	43.59	0.126*
Tract ranking MaleLF	209.33	44.57	218.87	48.16	0.087
Tract ranking Vacant	215.73	52.28	228.45	44.89	0.104
Tract ranking NoVehicle	198.98	61.41	223.82	46.85	0.174**
Tract ranking Dropout_12	120.62	116.80	116.01	114.72	0.017
RankSuburbs_Sum	1363.54	300.71	1459.44	294.24	0.133*

Table 4. Bivariate association between attendance group and predictors—Grade 2 (N=279)

	Non-Chronic absent 79.60%		Chronic absent 20.40%		Correlation
	Proportion		Proportion		
Female	0.51		0.40		.09
old for grade	0.11		0.18		.08
School Move	0.09		0.14		.07
CYF	0.22		0.44		.20***
DA	0.00		0.00		NA
MH	0.10		0.25		.18**
EI	0.10		0.09		.02
FSC	0.09		0.12		.04
HH	0.09		0.11		.03
MR	0.00		0.00		na
JPO	0.00		0.00		na
DPW	0.27		0.40		.12*
HACP	0.04		0.00		.09
homestead	0.35		0.18		.15*
	M	SD	M	SD	
Sum of Total Delinquency in 2013	32029.38	13684.41	26750.80	13327.98	0.155**
Number of parcels-structure built before 1914	262.73	156.95	288.82	141.49	0.068
Medium house sales price in 2013	44341.61	44158.94	29929.17	34365.50	0.136*
% below poverty level	22.59	12.27	27.06	12.49	0.145*
% black	0.09	0.04	0.10	0.04	0.137*
Tract ranking Poverty	209.09	60.56	226.68	49.40	0.121*
Tract ranking Poverty200	195.81	66.80	219.37	54.94	0.146*
Tract ranking FHF	207.84	46.62	224.05	38.87	0.144*
Tract ranking MaleLF	203.75	54.50	219.33	47.16	0.118*
Tract ranking Vacant	209.20	66.01	227.11	50.69	0.114
Tract ranking NoVehicle	195.32	72.29	217.33	60.74	0.126*
Tract ranking Dropout_12	117.47	116.37	165.51	104.75	0.168**
RankSuburbs_Sum			1499.39	332.82	0.173**

Table 5. Bivariate association between attendance group and predictors— Grade 3 (N=246)

	Non-Chronic absent 81.30%		Chronic absent 18.70%		Correlation
	Proportion		Proportion		
Female	0.57		0.46		.08
old for grade	0.16		0.33		.17**
School Move	0.08		0.17		.13*
CYF	0.26		0.28		.02
DA	0.01		0.02		.04
MH	0.19		0.33		.12
EI	0.08		0.13		.08
FSC	0.12		0.35		.23***
HH	0.09		0.15		.09
MR	0.00		0.02		.07
JPO	0.00		0.00		na
DPW	0.34		0.48		.11
HACP	0.05		0.07		.02
homestead	0.28		0.22		.05
	M	SD	M	SD	
Sum of Total Delinquency in 2013	32438.58	13747.45	33895.71	15508.31	0.04
Number of parcels-structure built before 1914	281.92	143.91	317.83	139.53	0.098
Medium house sales price in 2013	37246.06	35928.47	29357.88	30293.93	0.088
% below poverty level	22.91	11.01	25.77	10.40	0.102
% black	0.09	0.04	0.10	0.05	0.08
Tract ranking Poverty	216.98	47.94	230.35	39.14	0.112
Tract ranking Poverty200	204.93	53.11	218.11	43.75	0.1
Tract ranking FHF	209.55	45.50	220.98	35.39	0.102
Tract ranking MaleLF	209.86	44.69	218.30	44.94	0.074
Tract ranking Vacant	219.92	51.89	233.11	45.12	0.101
Tract ranking NoVehicle	203.19	59.23	215.17	54.44	0.08
Tract ranking Dropout_12	103.27	115.27	111.37	117.05	0.027
RankSuburbs_Sum	1367.71	293.71	1447.39	291.65	0.106

Table 6. Bivariate association between attendance group and predictors— Grade 4 (N=272)

	Non-Chronic absent		Chronic absent		Correlation
	80.10%		19.90%		
	Proportion		Proportion		
Female	0.47		0.41		.05
old for grade	0.13		0.28		.16**
School Move	0.06		0.15		.14*
CYF	0.24		0.31		.07
DA	0.00		0.00		NA
MH	0.18		0.26		.08
EI	0.10		0.15		.07
FSC	0.16		0.24		.09
HH	0.09		0.07		.02
MR	0.00		0.00		.03
JPO	0.00		0.00		na
DPW	0.28		0.39		.09
HACP	0.04		0.07		.06
homestead	0.37		0.13		.20***
	M	SD	M	SD	
Sum of Total Delinquency in 2013	29880.19	13742.91	28447.67	14263.61	0.041
Number of parcels-structure built before 1914	262.83	149.18	329.46	123.84	0.181**
Medium house sales price in 2013	42066.34	42053.96	22916.90	22994.76	0.193***
% below poverty level	23.08	12.08	27.81	11.38	0.157*
% black	0.09	0.05	0.10	0.04	0.096
Tract ranking Poverty	213.86	56.02	236.48	27.32	0.173**
Tract ranking Poverty200	201.10	62.45	231.04	29.56	0.204***
Tract ranking FHF	209.23	46.06	227.02	35.20	0.159**
Tract ranking MaleLF	208.24	51.90	228.19	37.43	0.16**
Tract ranking Vacant	212.55	61.05	235.44	31.31	0.16**
Tract ranking NoVehicle	202.14	66.14	226.94	44.33	0.157**
Tract ranking Dropout_12	118.20	116.03	154.57	106.16	0.127*
RankSuburbs_Sum	1365.32	348.22	1539.69	233.05	0.208***

Table 7. Bivariate association between attendance group and predictors— Grade 5 (N=255)

	Non-Chronic absent 81.60%		Chronic absent 18.40%		Correlation
	Proportion		Proportion		
Female	0.51		0.34		.14*
old for grade	0.14		0.21		.07
School Move	0.05		0.06		.02
CYF	0.21		0.49		.25***
DA	0.00		0.00		.03
MH	0.21		0.32		.10
EI	0.08		0.04		.05
FSC	0.15		0.11		.05
HH	0.07		0.09		.02
MR	0.00		0.00		.03
JPO	0.00		0.00		na
DPW	0.25		0.38		.12
HACP	0.05		0.04		.01
homestead	0.40		0.26		.12
	M	SD	M	SD	
Sum of Total Delinquency in 2013	31976.21	13814.91	34642.80	15836.78	0.073
Number of parcels-structure built before 1914	278.97	156.54	313.19	136.71	0.087
Medium house sales price in 2013	42071.09	44515.50	36091.76	37668.56	0.054
% below poverty level	22.57	11.87	22.11	10.18	0.015
% black	0.09	0.05	0.09	0.05	0.003
Tract ranking Poverty	210.80	58.90	218.57	46.53	0.053
Tract ranking Poverty200	199.03	64.81	206.55	49.81	0.047
Tract ranking FHF	208.27	49.54	209.38	40.01	0.009
Tract ranking MaleLF	209.79	49.32	209.94	49.57	0.001
Tract ranking Vacant	212.79	63.87	227.09	49.69	0.09
Tract ranking NoVehicle	195.84	72.20	197.15	66.92	0.007
Tract ranking Dropout_12	107.49	116.06	91.49	111.54	0.054
RankSuburbs_Sum	1344.01	369.82	1360.17	307.09	0.018

Table 8. Bivariate association between attendance group and predictors— Grade 6 (N=271)

	Non-Chronic absent 84.50%		Chronic absent 15.50%		Correlation
	Proportion		Proportion		
Female	0.47		0.38		.07
old for grade	0.12		0.24		.13*
School Move	0.03		0.19		.27***
CYF	0.22		0.36		.12
DA	0.00		0.00		NA
MH	0.26		0.33		.06
EI	0.09		0.05		.06
FSC	0.14		0.05		.10
HH	0.03		0.05		.02
MR	0.00		0.00		.03
JPO	0.00		0.02		.14*
DPW	0.29		0.43		.11
HACP	0.04		0.05		.01
homestead	0.37		0.21		.12
	M	SD	M	SD	
Sum of Total Delinquency in 2013	30886.92	13595.79	30672.63	13796.77	0.006
Number of parcels-structure built before 1914	281.93	144.33	291.33	159.79	0.023
Medium house sales price in 2013	38308.57	39858.29	37589.88	37597.60	0.007
% below poverty level	23.31	11.50	23.61	11.33	0.009
% black	0.09	0.04	0.10	0.05	0.07
Tract ranking Poverty	217.38	47.99	219.02	49.09	0.012
Tract ranking Poverty200	205.62	54.69	209.33	53.63	0.025
Tract ranking FHF	212.10	44.92	210.48	46.72	0.013
Tract ranking MaleLF	207.65	49.85	211.55	48.72	0.029
Tract ranking Vacant	219.05	52.44	219.29	60.46	0.002
Tract ranking NoVehicle	205.18	58.61	197.62	72.87	0.045
Tract ranking Dropout_12	118.21	115.79	121.60	117.06	0.011
RankSuburbs_Sum	1385.19	312.76	1388.88	347.25	0.004

Table 9. Bivariate association between attendance group and predictors— Grade 7 (N=250)

	Non-Chronic absent 66.40%		Chronic absent 33.60%		Correlation
	Proportion		Proportion		
Female	0.54		0.43		.10
old for grade	0.13		0.30		.21***
School Move	0.03		0.15		.23***
CYF	0.22		0.37		.16*
DA	0.01		0.00		.05
MH	0.16		0.30		.16*
EI	0.05		0.08		.06
FSC	0.13		0.23		.13*
HH	0.04		0.13		.18**
MR	0.01		0.00		.04
JPO	0.02		0.04		.05
DPW	0.27		0.40		.14*
HACP	0.03		0.02		.02
homestead	0.42		0.26		.16*
	M	SD	M	SD	
Sum of Total Delinquency in 2013	31040.75	13385.25	32474.75	14447.64	0.049
Number of parcels-structure built before 1914	263.89	164.99	327.55	132.75	0.191**
Medium house sales price in 2013	46193.83	45542.03	26438.84	27847.21	0.225***
% below poverty level	21.46	11.57	25.22	10.58	0.157*
% black	0.09	0.05	0.10	0.05	0.101
Tract ranking Poverty	206.20	60.99	229.57	38.93	0.199**
Tract ranking Poverty200	193.47	67.47	219.80	41.10	0.204***
Tract ranking FHF	204.66	49.69	224.21	34.13	0.201***
Tract ranking MaleLF	203.37	52.78	223.79	40.43	0.194**
Tract ranking Vacant	208.22	66.77	232.56	45.88	0.187**
Tract ranking NoVehicle	193.16	72.81	215.80	55.45	0.157*
Tract ranking Dropout_12	106.11	118.15	112.73	116.03	0.027
RankSuburbs_Sum	1315.19	372.42	1458.45	287.71	0.192**

Table 10. Bivariate association between attendance group and predictors— Grade 8 (N=305)

	Non-Chronic absent 67.50%		Chronic absent 32.50%		Correlation
	Proportion		Proportion		
Female	0.44		0.49		.05
old for grade	0.12		0.41		.33***
School Move	0.02		0.10		.18***
CYF	0.20		0.41		.23***
DA	0.01		0.02		.04
MH	0.19		0.44		.27***
EI	0.05		0.05		.004
FSC	0.16		0.21		.07
HH	0.06		0.10		.08
MR	0.02		0.00		.08
JPO	0.01		0.05		.13*
DPW	0.24		0.48		.25***
HACP	0.01		0.03		.05
homestead	0.46		0.22		.23***
	M	SD	M	SD	
Sum of Total Delinquency in 2013	30634.16	13619.51	29894.27	13905.43	0.025
Number of parcels-structure built before 1914	258.32	161.97	301.06	126.51	0.131*
Medium house sales price in 2013	47474.94	45468.26	28802.02	30111.29	0.209***
% below poverty level	21.90	12.53	26.35	10.83	0.171**
% black	0.09	0.04	0.10	0.05	0.143*
Tract ranking Poverty	206.60	59.93	229.63	40.13	0.195***
Tract ranking Poverty200	193.71	67.23	220.18	44.32	0.2***
Tract ranking FHF	202.68	49.97	222.85	38.25	0.2***
Tract ranking MaleLF	202.69	55.47	215.70	47.21	0.115*
Tract ranking Vacant	207.34	64.28	231.12	42.93	0.188***
Tract ranking NoVehicle	191.71	72.07	218.38	55.13	0.184***
Tract ranking Dropout_12	118.41	116.13	122.13	114.09	0.015
RankSuburbs_Sum	1323.15	373.28	1459.99	283.58	0.182***

Table 11. Bivariate association between attendance group and predictors— Grade 9 (N=289)

	Non-Chronic absent 63.30%		Chronic absent 36.70%		Correlation
	Proportion		Proportion		
Female	0.43		0.42		.02
old for grade	0.13		0.34		.26***
School Move	0.00		0.08		.24***
CYF	0.18		0.31		.15*
DA	0.01		0.02		.06
MH	0.18		0.32		.16**
EI	0.03		0.02		.03
FSC	0.09		0.11		.03
HH	0.01		0.08		.17**
MR	0.01		0.00		.04
JPO	0.01		0.06		.13*
DPW	0.14		0.35		.25***
HACP	0.02		0.03		.04
homestead	0.51		0.28		.23***
	M	SD	M	SD	
Sum of Total Delinquency in 2013	31576.08	13243.38	31800.29	14255.42	0.008
Number of parcels-structure built before 1914	240.36	167.93	305.04	137.09	0.195***
Medium house sales price in 2013	54802.73	46763.78	33708.25	37047.06	0.229***
% below poverty level	18.88	11.33	23.55	11.39	0.195***
% black	0.08	0.04	0.09	0.04	0.157**
Tract ranking Poverty	195.62	60.10	219.00	47.54	0.198***
Tract ranking Poverty200	181.00	67.07	210.56	51.85	0.225***
Tract ranking FHF	191.93	50.64	213.33	45.40	0.208***
Tract ranking MaleLF	196.97	51.95	213.30	44.35	0.158**
Tract ranking Vacant	199.21	66.25	224.98	47.98	0.203***
Tract ranking NoVehicle	177.66	71.42	202.84	65.06	0.173**
Tract ranking Dropout_12	119.52	118.95	112.85	113.18	0.028
RankSuburbs_Sum	1261.91	359.80	1396.86	312.27	0.187***

Table 12. Bivariate association between attendance group and predictors— Grade 10 (N=282)

	Non-Chronic absent 64.20%		Chronic absent 35.80%		Correlation
	Proportion		Proportion		
Female	0.46		0.48		.02
old for grade	0.16		0.26		.12*
School Move	0.01		0.04		.10
CYF	0.15		0.30		.17**
DA	0.00		0.01		.08
MH	0.18		0.33		.17**
EI	0.02		0.00		.09
FSC	0.09		0.12		.04
HH	0.03		0.10		.15*
MR	0.02		0.00		.09
JPO	0.04		0.18		.24***
DPW	0.18		0.35		.19**
HACP	0.03		0.01		.06
homestead	0.55		0.28		.27***
	M	SD	M	SD	
Sum of Total Delinquency in 2013	29267.63	12118.68	31324.80	14579.17	0.076
Number of parcels-structure built before 1914	223.77	136.13	298.45	144.08	0.25***
Medium house sales price in 2013	53195.37	45446.41	35592.82	38230.08	0.193***
% below poverty level	17.91	10.54	23.15	10.76	0.231***
% black	0.08	0.04	0.09	0.05	0.193***
Tract ranking Poverty	195.34	54.86	218.36	47.81	0.207***
Tract ranking Poverty200	183.11	61.63	208.83	52.36	0.207***
Tract ranking FHF	192.30	48.31	210.28	48.25	0.176**
Tract ranking MaleLF	193.07	49.55	216.93	39.67	0.241***
Tract ranking Vacant	198.23	58.86	226.74	46.79	0.243***
Tract ranking NoVehicle	178.17	67.22	200.52	64.44	0.16**
Tract ranking Dropout_12	109.38	113.86	115.67	117.16	0.026
RankSuburbs_Sum	1249.60	311.38	1397.34	312.14	0.222***

Table 13. Bivariate association between attendance group and predictors— Grade 11 (N=247)

	Non-Chronic absent 55.10%		Chronic absent 44.90%		Correlation
	Proportion		Proportion		
Female	0.49		0.59		.09
old for grade	0.16		0.17		.01
School Move	0.03		0.04		.02
CYF	0.16		0.30		.16*
DA	0.01		0.03		.04
MH	0.18		0.37		.21***
EI	0.01		0.00		.06
FSC	0.07		0.13		.09
HH	0.04		0.06		.06
MR	0.01		0.00		.06
JPO	0.03		0.14		.21***
DPW	0.12		0.29		.22***
HACP	0.01		0.03		.04
homestead	0.56		0.35		.21***
	M	SD	M	SD	
Sum of Total Delinquency in 2013	32317.78	13678.23	34001.10	14518.26	0.06
Number of parcels-structure built before 1914	245.42	165.45	300.82	139.97	0.176**
Medium house sales price in 2013	51974.91	45722.51	31703.49	27308.17	0.254***
% below poverty level	19.08	11.32	24.06	10.22	0.223***
% black	0.08	0.04	0.09	0.04	0.123
Tract ranking Poverty	196.62	60.70	224.39	37.61	0.259***
Tract ranking Poverty200	181.71	68.69	212.63	41.70	0.257***
Tract ranking FHF	191.93	54.24	213.87	42.02	0.218***
Tract ranking MaleLF	201.37	45.57	214.21	37.97	0.15*
Tract ranking Vacant	207.10	56.22	229.97	39.49	0.225**
Tract ranking NoVehicle	186.12	61.68	208.45	51.75	0.191**
Tract ranking Dropout_12	121.29	117.86	98.82	115.26	0.096
RankSuburbs_Sum	1286.15	322.36	1402.34	240.17	0.197**

Table 14. Bivariate association between attendance group and predictors— Grade 12 (N=263)

	Non-Chronic absent 58.20%		Chronic absent 41.80%		Correlation
	Proportion		Proportion		
Female	0.52		0.61		.09
old for grade	0.10		0.25		.20***
School Move	0.00		0.05		.16**
CYF	0.09		0.22		.18**
DA	0.01		0.04		.11
MH	0.16		0.28		.14*
EI	0.01		0.02		.02
FSC	0.04		0.10		.12*
HH	0.02		0.05		.09
MR	0.01		0.00		.05
JPO	0.07		0.12		.09
DPW	0.14		0.27		.17**
HACP	0.00		0.04		.15*
homestead	0.62		0.33		.29***
	M	SD	M	SD	
Sum of Total Delinquency in 2013	29448.49	11879.53	31780.59	13649.30	0.091
Number of parcels-structure built before 1914	205.91	151.57	304.76	157.73	0.303***
Medium house sales price in 2013	58069.93	47971.60	37615.68	42561.92	0.216***
% below poverty level	19.30	12.61	24.09	11.75	0.19**
% black	0.08	0.04	0.10	0.05	0.197***
Tract ranking Poverty	191.14	67.02	218.05	53.81	0.211***
Tract ranking Poverty200	176.39	74.02	206.32	61.78	0.21***
Tract ranking FHF	190.90	52.81	210.19	53.24	0.177**
Tract ranking MaleLF	193.20	54.48	216.25	44.73	0.22***
Tract ranking Vacant	188.97	73.94	223.32	49.76	0.253***
Tract ranking NoVehicle	172.99	79.43	210.58	56.99	0.254***
Tract ranking Dropout_12	128.36	116.61	129.03	116.05	0.003
RankSuburbs_Sum	1241.95	408.62	1413.75	323.59	0.221***

Figure 1. Effect sizes of demographic variables by grades

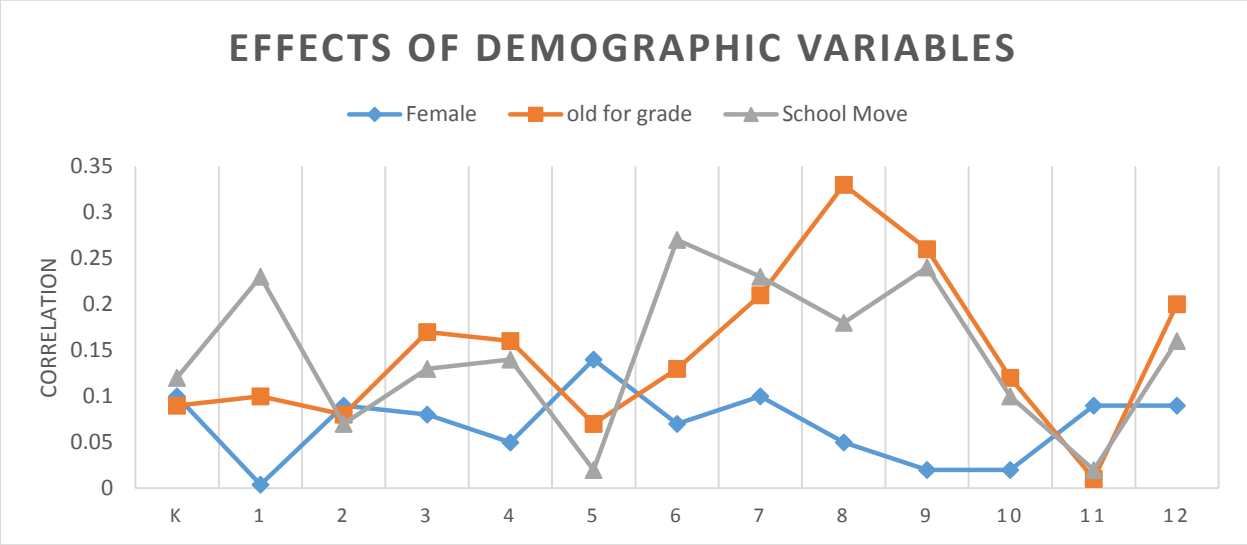
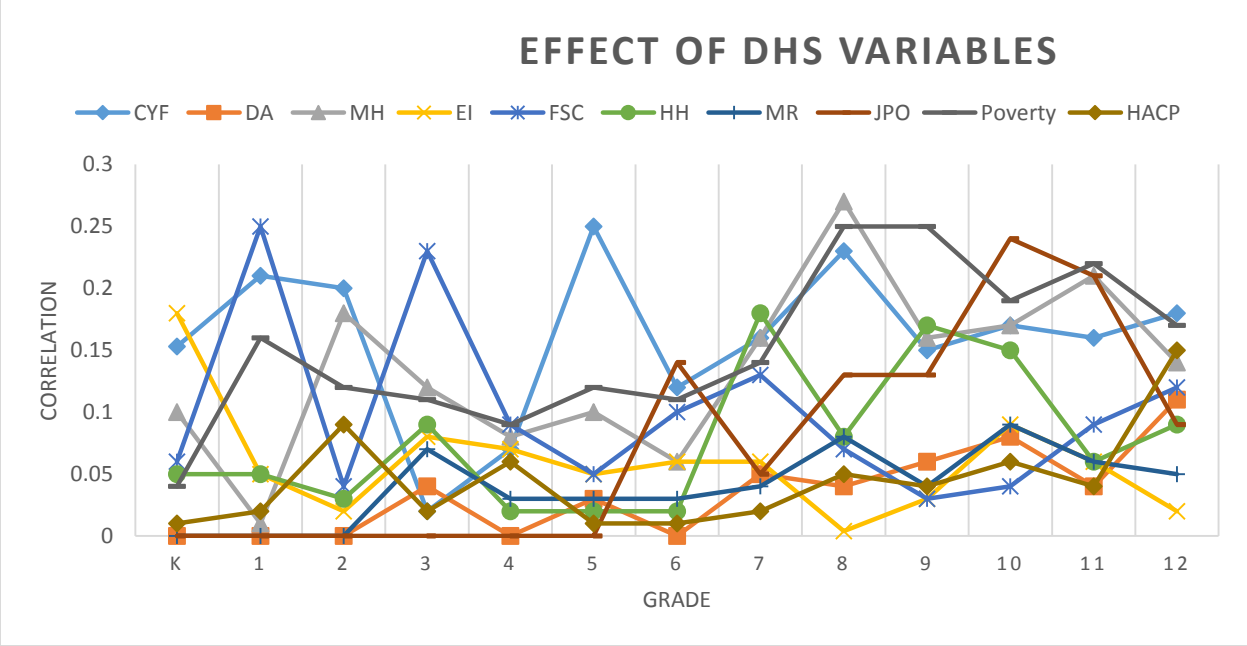
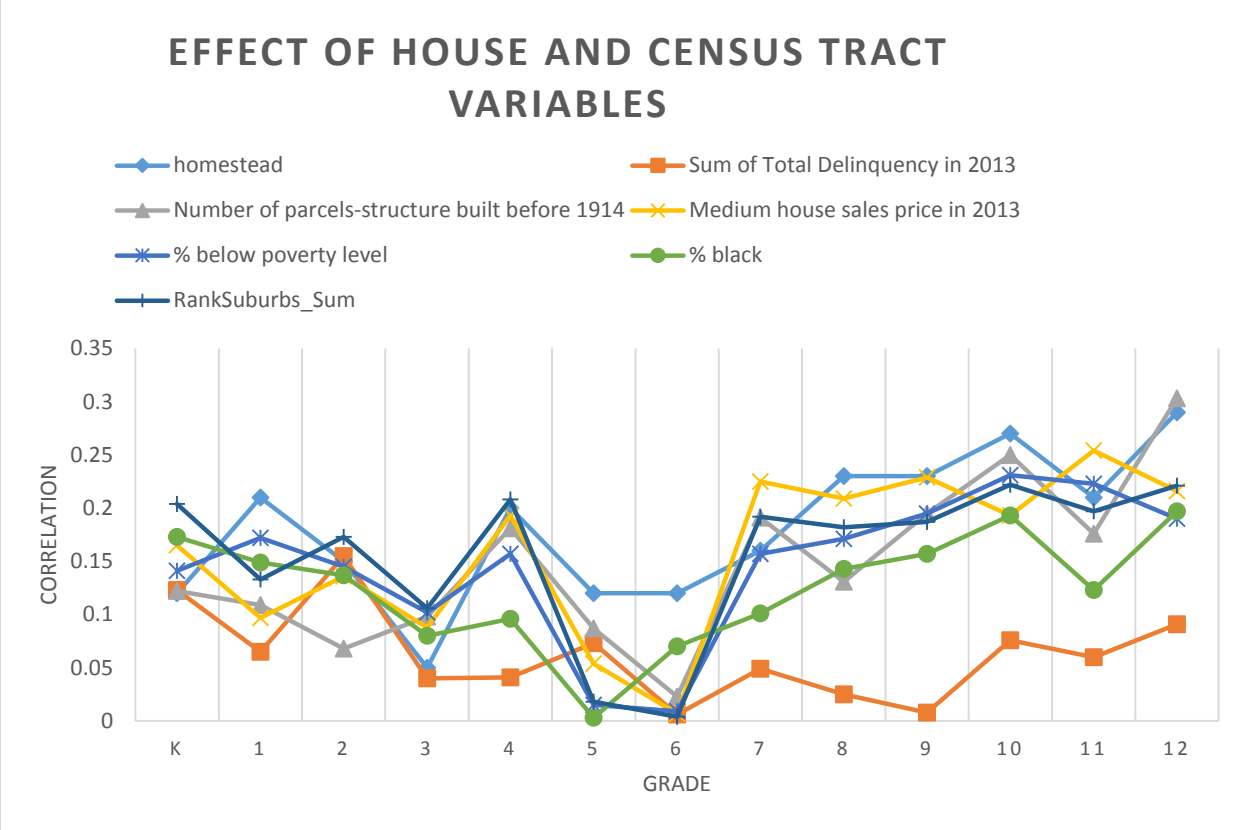


Figure 2. Effect sizes of DHS involvement variables by grades



Among tract ranking variables, the sum track ranking presents consistently significant bivariate relationship with chronic absence, and thus was selected as a census tract variable and presented in Figure 3.

Figure 3. Effect sizes of house and census tract variables by grades



2. Logistic Regression

Logistic regression was used to predict chronic absence for each grade. Among tract ranking variables, the sum track ranking presents consistently significant bivariate relationship with chronic absence, and thus was selected as a census tract variable in both logistic regression and CART. However, the sum track ranking correlated highly with other tract variables, resulting with multicollinearity (VIF>10), and thus was excluded from logistic regression analysis.

Table 15-

Grade	6		7		8	
Female	0.939		0.639		1.397	
old for grade	3.096	*	3.621	***	5.549	***
School Move	29.105	***	5.236	**	5.002	*
CYF	1.684		1.415		1.966	*
DA			0		0.402	
MH	0.735		1.409		2.769	**
EI	0.424		2.139		1.288	
FSC	0.161	*	1.57		0.734	
HH	1.354		3.266		0.553	
MR	0		0		0	
	2.43E+1					
JPO	0		0.65		2.182	
DPW	1.142		0.705		1.459	
HACP	0.107		0.265		0.758	
homestead	0.331	*	0.684		0.414	*
Sum of Total Delinquency in 2013	1		1		1	
Number of parcels-structure built before 1914	1		1.001		0.997	
Medium house sales price in 2013	1		1		1	*
% below poverty level	0.973		0.977		0.983	
% black	276.223		0.196		2.197	
Pseudo R2	0.24		0.27		0.36	

Table 17 present odds ratio and statistical significance for grades k-5, 6-8, and 9-12 respectively.

Table 15. Odds ratio of logistic regression predicting chronic absence for k to 5th grade (* p < .05, ** p < .01, *** p < .001)

Grade	K		1		2		3		4		5	
Female	0.671		1.138		0.668		0.645		0.901		0.418	*
old for grade	1.198		1.749		1.478		2.177		2.741	*	1.512	
School Move	1.855		4.365	***	2.036		3.364	*	2.002		1.833	
CYF	1.685		2.114	*	2.402	*	0.556		0.994		4.959	***
DA					0		1.699				0	
MH	1.555		0.476		2.846	*	1.439		1.174		1.145	
EI	2.794	*	1.476		0.537		0.982		1.753		0.399	
FSC	1.034		2.997	**	0.667		3.328	**	1.099		0.212	*
HH	1.314		0.8		0.8		1.428		0.467		0.487	
MR							3.118		0		0	
JPO												
DPW	0.621		1.418		1.081		1.114		1.006		1.745	
HACP	0.918		0.242		0		0.432		2.027		0.221	
homestead	0.638		0.397	*	0.482		1.043		0.359	*	0.484	
Sum of Total Delinquency in 2013	1.000	*	1		1	*	1		1		1	
Number of parcels-structure built before 1914	1.003		1		1.001		1		1.004	*	1.003	
Medium house sales price in 2013	1.000		1		1		1		1		1	
% below poverty level	0.986		1.022		0.982		1.007		1.009		0.94	*
% black	1.668		32.165		0.74		846.228		0.002		0.952	
Pseudo R^2	0.168		0.236		0.217		0.17		0.2		0.23	

Table 16. Odds ratio of logistic regression predicting chronic absence for 6th to 8th grade (* p < .05, ** p < .01, *** p < .001)

Grade	6		7		8	
Female	0.939		0.639		1.397	
old for grade	3.096	*	3.621	***	5.549	***
School Move	29.105	***	5.236	**	5.002	*
CYF	1.684		1.415		1.966	*
DA			0		0.402	
MH	0.735		1.409		2.769	**
EI	0.424		2.139		1.288	
FSC	0.161	*	1.57		0.734	
HH	1.354		3.266		0.553	
MR	0		0		0	
	2.43E+1					
JPO	0		0.65		2.182	
DPW	1.142		0.705		1.459	
HACP	0.107		0.265		0.758	
homestead	0.331	*	0.684		0.414	*
Sum of Total Delinquency in 2013	1		1		1	
Number of parcels-structure built before 1914	1		1.001		0.997	
Medium house sales price in 2013	1		1		1	*
% below poverty level	0.973		0.977		0.983	
% black	276.223		0.196		2.197	
Pseudo R^2	0.24		0.27		0.36	

Table 17. Odds ratio of logistic regression predicting chronic absence for 9th to 12th grade (* p < .05, ** p < .01, *** p < .001) CART

Grade	9		10		11	12	
Female	0.945		0.968	*	1.548	1.875	*
old for grade	3.029	**	1.025		0.955	2.622	*
School Move	2.81E+09		8.176	*	1.131	2.67E+09	
CYF	0.977		0.976	*	1.305	1.147	
DA	0.478		6.24E+08		0.484	5.951	
MH	1.58		2.263	*	1.753	1.458	
EI	1.165		0	*	0	0.566	
FSC	0.562		0.64		1.089	2.673	
HH	3.303		1.919		0.874	0.813	
MR	0		0		0	0	
JPO	3.089		3.987	*	3.466	1.046	
DPW	1.828		1.107	*	1.563	0.72	
HACP	0.41		0.165		0.772	4.87E+08	
homestead	0.537	*	0.407	**	0.568	0.461	*
Sum of Total Delinquency in 2013	1		1	*	1	1	
Number of parcels-structure built before 1914	1.001		1.002	*	0.998	1.004	**
Medium house sales price in 2013	1		1		1	1	
% below poverty level	0.99		1.003		1.012	0.961	
% black	29.095		469.226		0.988	130.892	
Pseudo R^2	0.29		0.28		0.21	0.3	

3. Classification and Regression Tree Analysis

3.1 Importance of predictors for grades k-5

The 8 predictors which had the highest average importance value across grades K-5 are highlighted in red below and they are displayed in Figure 4

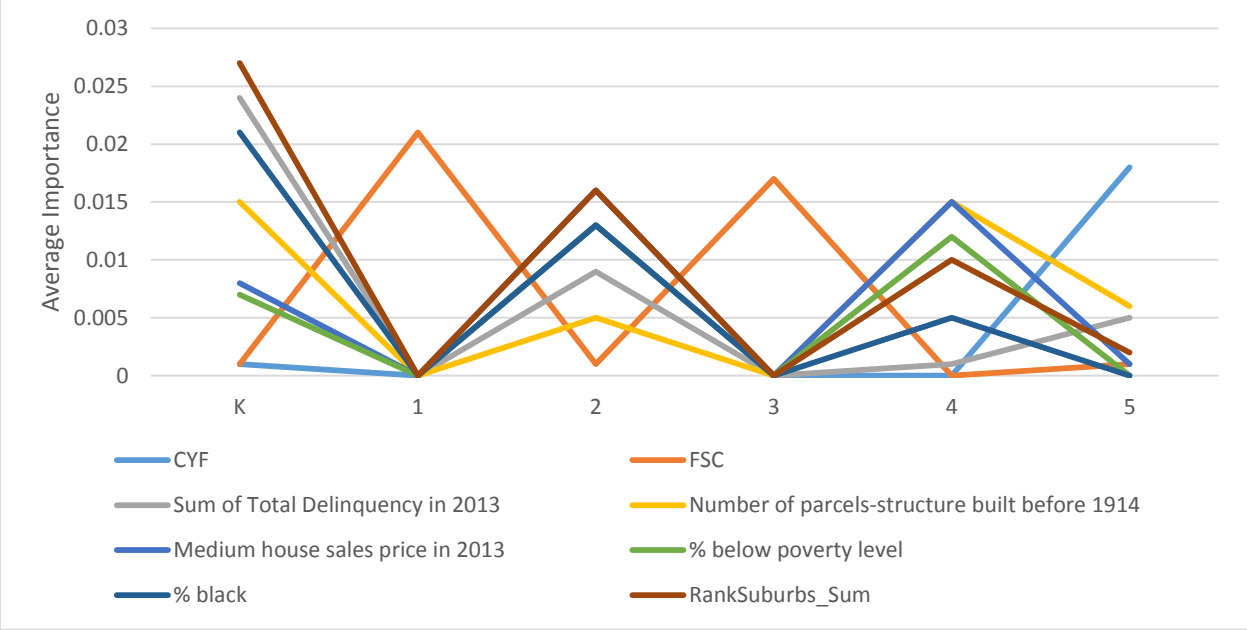
Grade	K	1	2	3	4	5	Average
Female	0.002	0	0	0	0	0	0.0003
old for grade	0	0	0.002	0	0	0	0.0003
School Move	0	0	0	0	0	0	0.0000
CYF	0.001	0	0.013	0	0	0.018	0.0053
DA	0	0	0	0	0	0	0.0000
MH	0	0	0.01	0	0	0.001	0.0018
EI	0	0	0	0	0	0	0.0000
FSC	0.001	0.021	0.001	0.017	0	0.001	0.0068
HH	0	0	0	0	0	0	0.0000
MR	0	0	0	0	0	0	0.0000
JPO	0	0	0	0	0	0	0.0000
DPW	0	0	0.005	0	0	0.005	0.0017
HACP	0	0	0	0	0	0	0.0000
homestead	0.004	0	0.007	0	0.008	0	0.0032
Sum of Total Delinquency in 2013	0.024	0	0.009	0	0.001	0.005	0.0065
Number of parcels-structure built before 1914	0.015	0	0.005	0	0.015	0.006	0.0068
Medium house sales price in 2013	0.008	0	0.016	0	0.015	0.001	0.0067
% below poverty level	0.007	0	0.013	0	0.012	0	0.0053
% black	0.021	0	0.013	0	0.005	0	0.0065
RankSuburbs_Sum	0.027	0	0.016	0	0.01	0.002	0.0092

Figure 4: 1) CYF, 2) FSC, 3) sum of total delinquency in 2013, 4) number of parcels built before 1914, 5) medium house sales price in 2013, and 6) percent below poverty level, 7) percent black, 8) rank sum suburbs.

Table 18. Average effects of predictors for Chronic Absence across Grades K-5.

Grade	K	1	2	3	4	5	Average
Female	0.002	0	0	0	0	0	0.0003
old for grade	0	0	0.002	0	0	0	0.0003
School Move	0	0	0	0	0	0	0.0000
CYF	0.001	0	0.013	0	0	0.018	0.0053
DA	0	0	0	0	0	0	0.0000
MH	0	0	0.01	0	0	0.001	0.0018
EI	0	0	0	0	0	0	0.0000
FSC	0.001	0.021	0.001	0.017	0	0.001	0.0068
HH	0	0	0	0	0	0	0.0000
MR	0	0	0	0	0	0	0.0000
JPO	0	0	0	0	0	0	0.0000
DPW	0	0	0.005	0	0	0.005	0.0017
HACP	0	0	0	0	0	0	0.0000
homestead	0.004	0	0.007	0	0.008	0	0.0032
Sum of Total Delinquency in 2013	0.024	0	0.009	0	0.001	0.005	0.0065
Number of parcels-structure built before 1914	0.015	0	0.005	0	0.015	0.006	0.0068
Medium house sales price in 2013	0.008	0	0.016	0	0.015	0.001	0.0067
% below poverty level	0.007	0	0.013	0	0.012	0	0.0053
% black	0.021	0	0.013	0	0.005	0	0.0065
RankSuburbs_Sum	0.027	0	0.016	0	0.01	0.002	0.0092

Figure 4. Average importance of predictors for chronic absence across grades k-5.



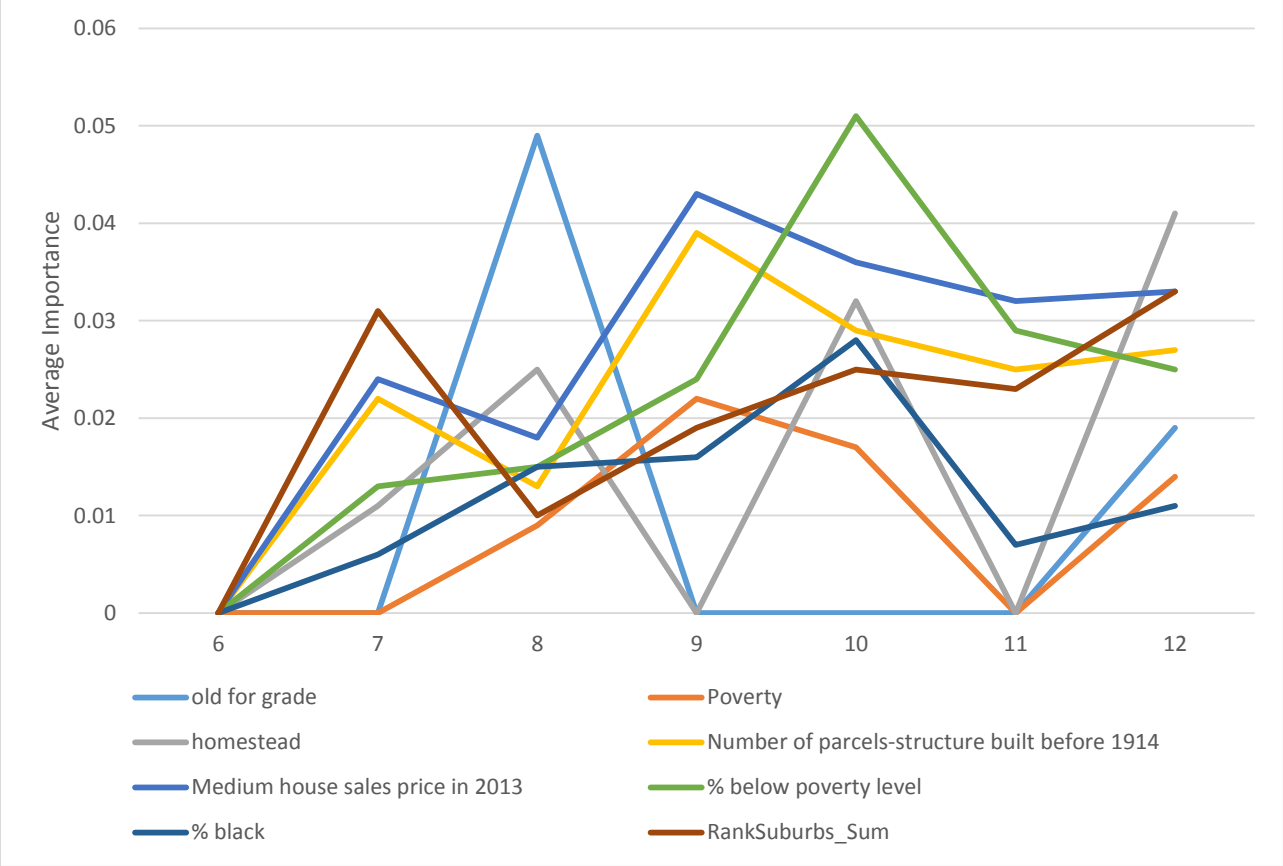
3.2 Importance of predictors for grades 6-12

The 8 predictors which had the highest average importance value across grades 6-12 are highlighted in red below and they are displayed in Figure 5: 1) old for grade, 2) DPW (ever in public welfare), 3) homestead, 4) number of parcels built before 1914, 5) medium house sales price in 2013, and 6) percent below poverty level, 7) percent black, 8) ranksuburbs_sum.

Table 19. Average effects of predictors for Chronic Absence across Grades 6-12.

Grade	6	7	8	9	10	11	12	Average
Female	0	0	0	0	0	0.008	0.004	0.002
old for grade	0	0	0.049	0	0	0	0.019	0.010
School Move	0	0	0.005	0	0	0	0.013	0.003
CYF	0	0	0.013	0.004	0.013	0	0.015	0.006
DA	0	0	0	0	0	0	0	0.000
MH	0	0	0.009	0.009	0	0.006	0.01	0.005
EI	0	0	0.001	0.001	0.003	0	0	0.001
FSC	0	0	0	0	0	0	0.007	0.001
HH	0	0	0.001	0.008	0	0	0.004	0.002
MR	0	0	0	0	0	0	0	0.000
JPO	0	0	0	0	0	0	0	0.000
DPW	0	0	0.009	0.022	0.017	0	0.014	0.009
HACP	0	0	0	0	0	0	0.01	0.001
homestead	0	0.011	0.025	0	0.032	0	0.041	0.016
Sum of Total Delinquency in 2013	0	0.001	0.004	0.002	0.004	0	0.004	0.002
Number of parcels-structure built before 1914	0	0.022	0.013	0.039	0.029	0.025	0.027	0.022
Medium house sales price in 2013	0	0.024	0.018	0.043	0.036	0.032	0.033	0.027
% below poverty level	0	0.013	0.015	0.024	0.051	0.029	0.025	0.022
% black	0	0.006	0.015	0.016	0.028	0.007	0.011	0.012
RankSuburbs_Sum	0	0.031	0.01	0.019	0.025	0.023	0.033	0.020

Figure 5. Average importance of predictors for Chronic absence across grades 6-12.



3.3 Grade K

- N = 342
- 3 predictors contributed to the classification of chronic absence. CART produced 6 child nodes
- The predictors are: level-1, sum of total delinquency; level-2, number of parcels-structure built before 1914; level-3, percent below poverty level.
- Node 1 had the highest levels of chronic absence (41.1%). Node 1 contained 27.8% of students who were in tracts that had sum of total delinquency less or equal to 16228 in 2013.
- Node 5 had the lowest level of chronic absence (0%) which contained 11.7% of students who were in tracts that had sum of total delinquency more than 16228, number of parcel built before 1914 less or equal to 334 and percent below poverty less or equal to 11.
- The largest node, Node 4, had 35.7% of total students. Node 4 contained student who were in the tracts that had sum of total delinquency more than 16228 and number of parcel build before 1914 more than 334. For this node, 28.7% were identified as chronic absent.
- Overall 75.1% of students were correctly classified.

Table 20. Importance table (Kindergarten)

Independent Variable	Importance	Normalized Importance
RankSuburbs_Sum	0.027	100.00%
Sum of Total Delinquency in 2013	0.024	87.30%
% black	0.021	77.10%
Number of parcels-structure built before 1914	0.015	54.10%
Medium house sales price in 2013	0.008	30.00%
% below poverty level	0.007	25.20%
homestead	0.004	13.20%
sex	0.002	9.00%
CYF (EVER IN Children, Youth, and Families Children)	0.001	3.70%
FSC (EVER IN Family Support Center)	0.001	3.20%
School Move or not (1: Yes)	0	0.50%
DPW: if any of Department of Public Welfare-FS, SSI, and TNF	5.23E-05	0.20%
HH (EVER IN Hunger and Homeless)	2.82E-05	0.10%

Table 21. Chronic absence by node (kindergarten).

sum of total delinquency	no. of parcels	% below poverty	Node	N	% Total Sample	% Chronic absence
<=16228			1	95	27.80%	41.10%
>16228	>333.5		4	122	35.70%	28.70%
>16228	<=333.5	<=11	5	40	11.70%	0.00%
>16228	<=333.5	>11	6	85	24.90%	12.90%

Figure 6. Chronic absence by node (kindergarten).

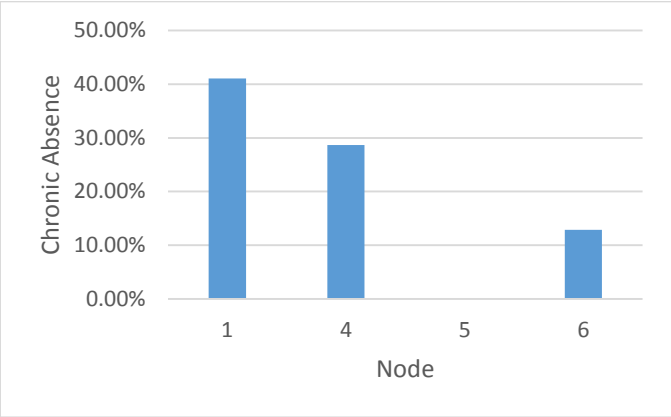
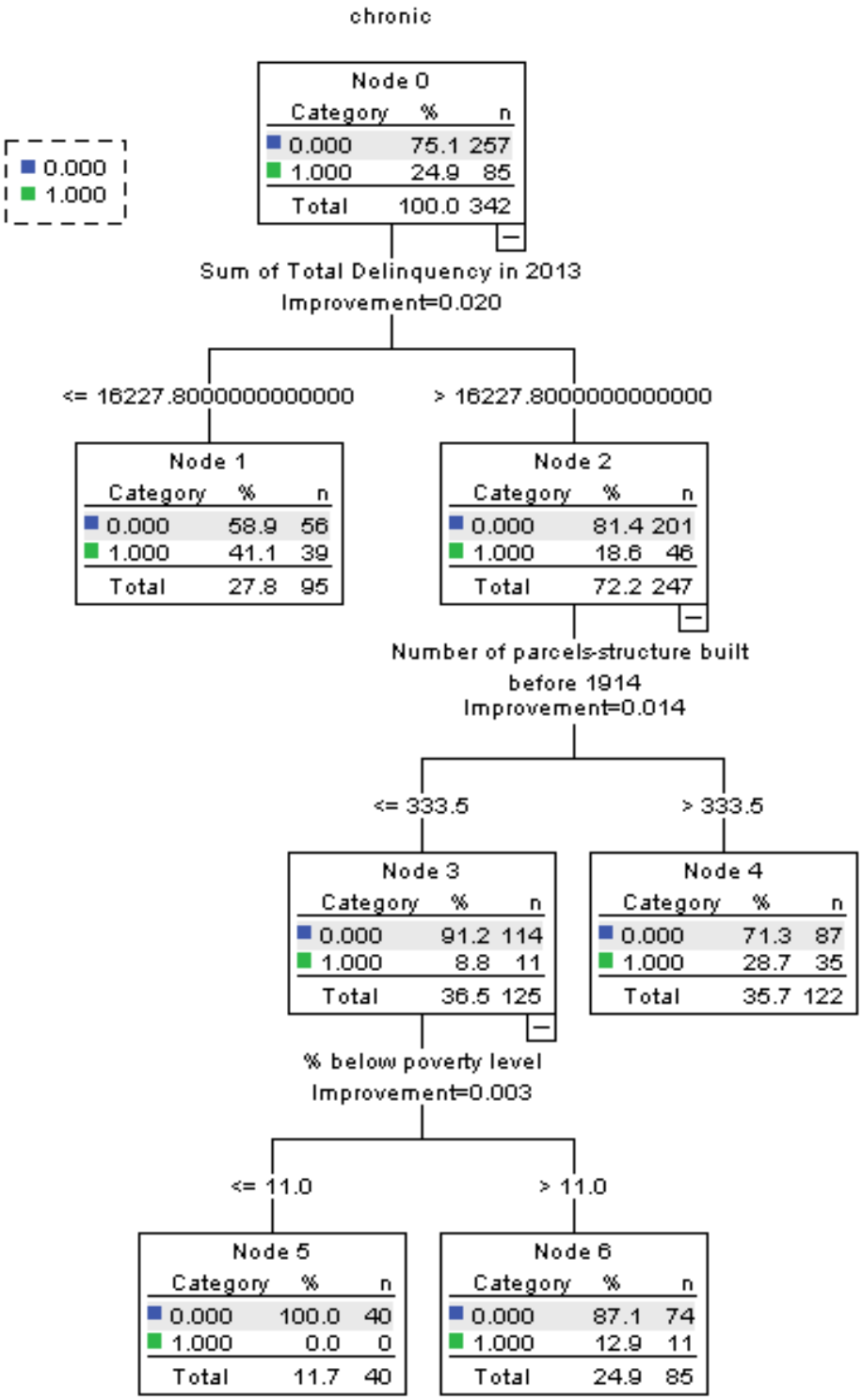


Figure 7. Tree Diagram (kindergarten).



3.4 Grade 1

- N = 319
- 1 predictor contributed to the classification of chronic absence. CART produced 2 child nodes.
- The predictors are: level-1, FSC (Ever in Family Support Center).
- Node 2 had the highest level of chronic absence (48.8%). Node 2 contained 12.9% of students who was once in Family Support Center.
- Node 1 had the lowest level of chronic absence (18.3%) which contained 87.1% of students who was never in Family Support Center.
- The largest node was Node 1 where identified 18.3% students as chronic absent.
- Overall 77.7% of students were correctly classified.

Table 22. Importance table (Grade 1)

Independent Variable	Importance	Normalized Importance
FSC (EVER IN Family Support Center)	0.021	100.00%

Table 23. Chronic absence by node (Grade 1).

FSC (Ever in Family Support Center)	Node	N	% Total Sample	% Chronic absence
N	1	278	87.10%	18.30%
Y	2	41	12.90%	48.80%

Figure 8. Chronic absence by node (Grade 1).

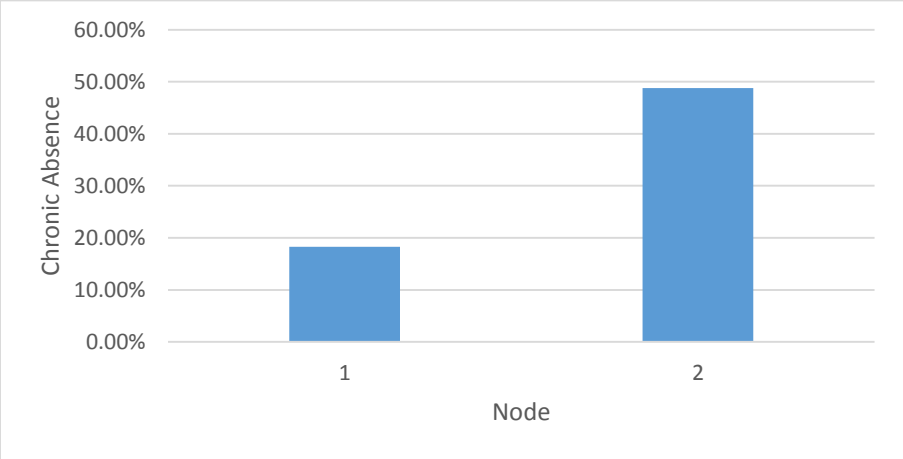
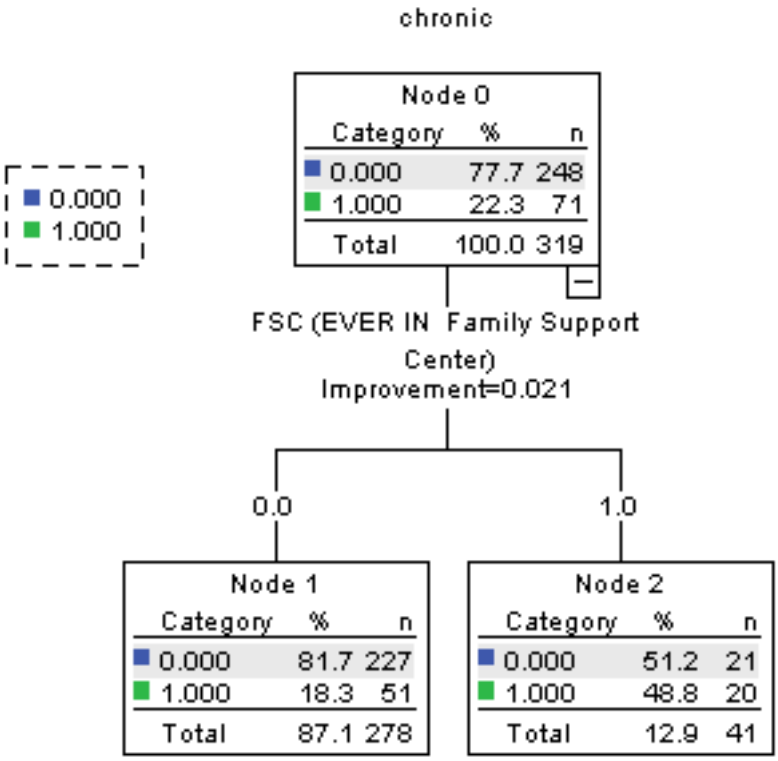


Figure 9. Tree Diagram (Grade 1).



3.5 Grade 2

- N = 279
- 1 predictor contributed to the classification of chronic absence. CART produced 2 child nodes.
- The predictors are: level-1, medium house sales price in 2013.
- Node 1 had the highest levels of chronic absence (30.8%). Node 1 contained 43% of students who were in tracts with medium house sales price in 2013 less or equal to 16975.
- Node 2 (also the largest node) had the lowest level of chronic absence (12.6%) which contained 57% of students who were in tracts with medium house sales price in 2013 larger than 16975.
- Overall 79.6% of students were correctly classified.

Table 24. Importance table (Grade 2)

Independent Variable	Importance	Normalized Importance
Medium house sales price in 2013	0.016	100.00%
RankSuburbs_Sum	0.016	100.00%
% below poverty level	0.013	82.60%
% black	0.013	79.30%
CYF (EVER IN Children, Youth, and Families Children)	0.013	78.80%
MH (EVER IN Mental Health)	0.01	61.80%
Sum of Total Delinquency in 2013	0.009	55.60%
homestead	0.007	44.30%
Number of parcels-structure built before 1914	0.005	31.80%
DPW: if any of Department of Public Welfare-FS, SSI, and TNF	0.005	29.60%
old for grade	0.002	11.60%
FSC (EVER IN Family Support Center)	0.001	4.00%
HH (EVER IN Hunger and Homeless)	0	1.50%
EI (EVER IN Early Intervention)	7.83E-05	0.50%

Table 25. Chronic absence by node (Grade 2).

Medium house sales price in 2013	Node	N	% Total Sample	% Chronic absence
<=16975	1	120	43.00%	30.80%
>16975	2	159	57.00%	12.60%

Figure 10. Chronic absence by node (Grade 2).

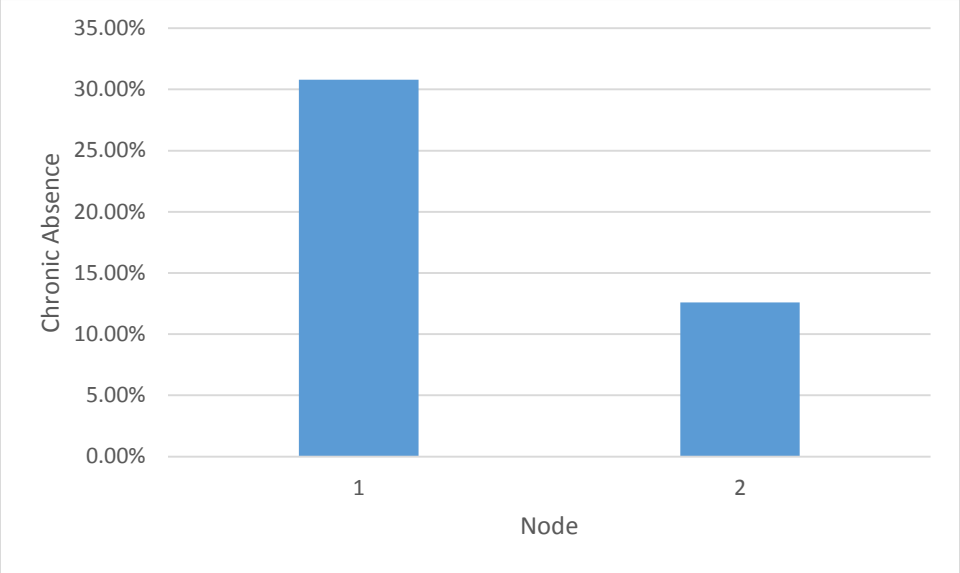
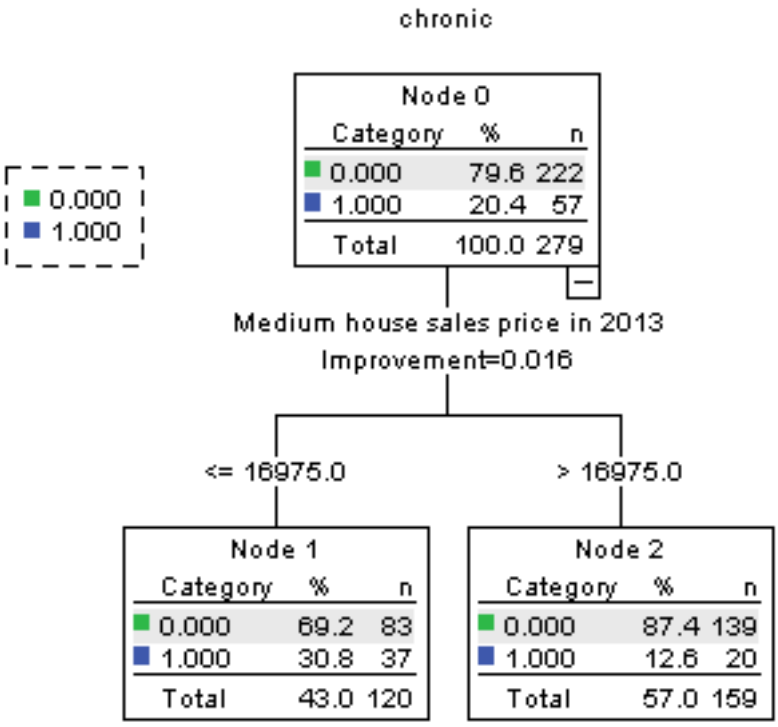


Figure 11. Tree Diagram (Grade 2).



3.6 Grade 3

- N = 246
- 1 predictor contributed to the classification of chronic absence. CART produced 2 child nodes.
- The predictors are: level-1, FSC (Ever in Family Support Center).
- Node 1 had the highest levels of chronic absence (39%) which contained 16.7% of students who were once in Family Support Center.
- Node 2 (also the largest node) had the lowest level of chronic absence (14.6%) which contained 83.3% of students who were never in Family Support Center.
- Overall 81.3% of students were correctly classified.

Table 26. Importance table (Grade 3)

Independent Variable	Importance	Normalized Importance
FSC (EVER IN Family Support Center)	0.017	100.00%

Table 27. Chronic absence by node (Grade 3).

FSC (Ever in Family Support Center)	Node	N	% Total Sample	% Chronic absence
Y	1	41	16.70%	39.00%
N	2	205	83.30%	14.60%

Figure 12. Chronic absence by node (Grade 3).

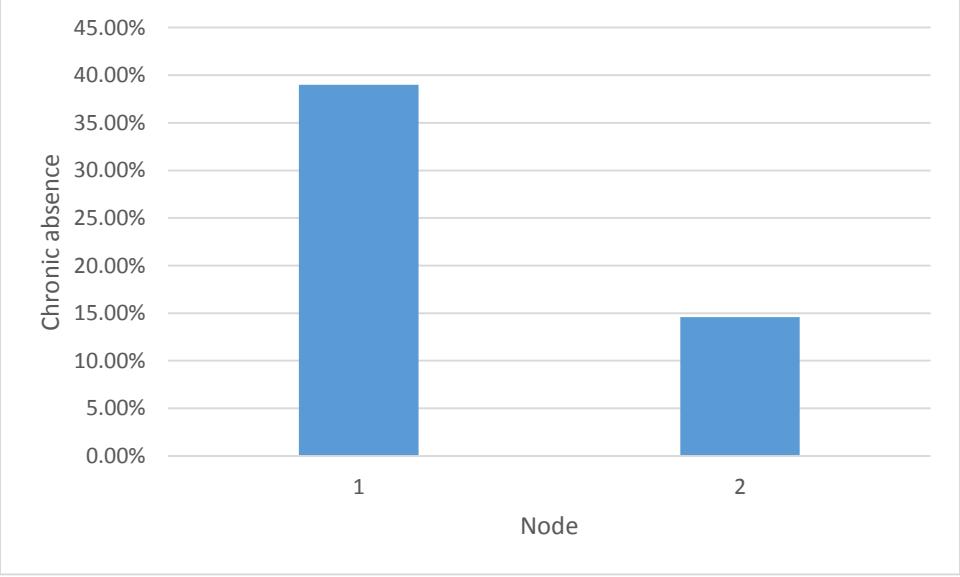
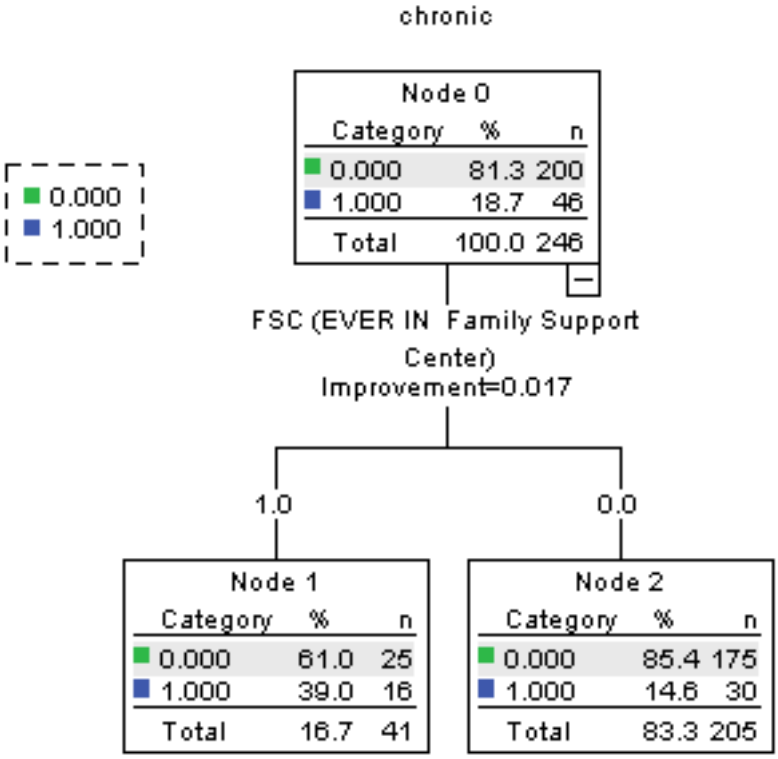


Figure 13. Tree Diagram (Grade 3).



3.7 Grade 4

- N = 272
- 2 predictors contributed to the classification of chronic absence. CART produced 4 child nodes.
- The predictors are: level-1, medium house sales price in 2013; level-2, homestead.
- Node 4 (also the largest node) had the highest levels of chronic absence (28.6%) which contained 59.2% of students who were in tracts with medium house sales price less or equal to 62050 in 2013 and with absence of homestead.
- Node 2 had the lowest level of chronic absence (3.3%) which contained 22.1% of students who were in tracts with medium house sales price more than 62050 in 2013.
- Overall 80.1% of students were correctly classified.

Table 28. Importance table (Grade 4)

Independent Variable	Importance	Normalized Importance
Medium house sales price in 2013	0.015	100.00%
Number of parcels-structure built before 1914	0.015	95.70%
% below poverty level	0.012	75.10%
RankSuburbs_Sum	0.01	64.10%
homestead	0.008	51.90%
% black	0.005	31.80%
Sum of Total Delinquency in 2013	0.001	3.80%

Table 29. Chronic absence by node (Grade 4).

Medium house sales price in 2013	homestead	Node	N	% Total Sample	% Chronic absence
>62050		2	60	22.10%	3.30%
<=62050	Y	3	51	18.80%	11.80%
<=62050	N	4	161	59.20%	28.60%

Figure 14. Chronic absence by node (Grade 4).

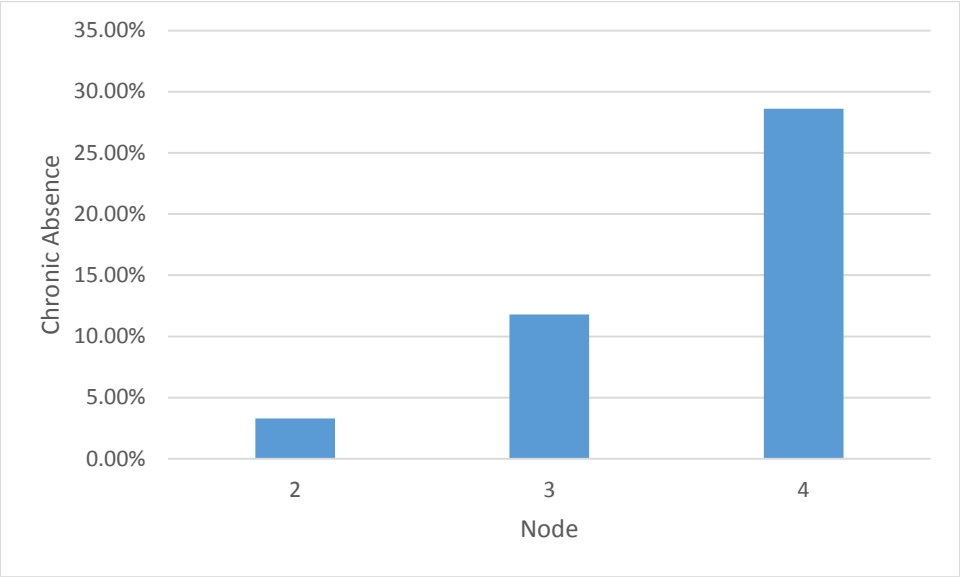
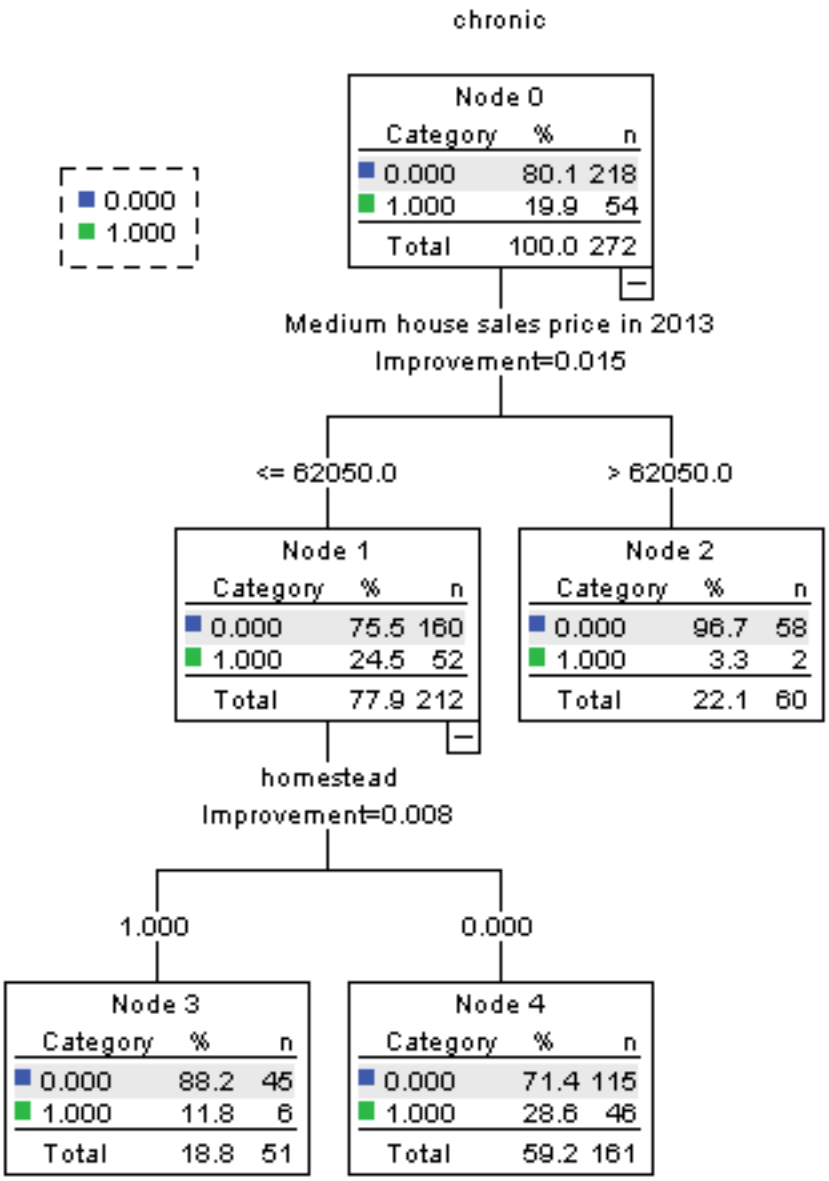


Figure 15. Tree Diagram (Grade 4).



3.8 Grade 5

- N = 255
- 2 predictors contributed to the classification of chronic absence. CART produced 4 child nodes.
- The predictors are: level-1, CYF (Ever in Children, Youth, and Families Children); level-2, Number of parcels built before 1914.
- Node 2 had the highest levels of chronic absence (34.3%) which contained 26.3% of students who was once in Children, Youth, and Family program.
- Node 3 (also the largest node) had the lowest level of chronic absence (7.7%) which contained 45.9% of students who were never in Children, Youth, and Family program but were in tracts with number of parcels built before 1914 less or equal to 334.
- Overall 81.6% of students were correctly classified.

Table 30. Importance table (Grade 5)

Independent Variable	Importance	Normalized Importance
CYF (EVER IN Children, Youth, and Families Children)	0.018	100.00%
Number of parcels-structure built before 1914	0.006	34.70%
Sum of Total Delinquency in 2013	0.005	26.70%
Poverty: if any of Department of Public Welfare-FS, SSI, and TNF	0.005	26.00%
RankSuburbs_Sum	0.002	10.70%
MH (EVER IN Mental Health)	0.001	6.00%
Medium house sales price in 2013	0.001	5.00%
FSC (EVER IN Family Support Center)	0.001	3.80%
% black	0	2.40%
EI (EVER IN Early Intervention)	0	1.10%
% below poverty level	0	0.90%
HH (EVER IN Hunger and Homeless)	0	0.60%

Table 31. Chronic absence by node (Grade 5).

CYF (Ever in Children, Youth, and Families Children)	Number of parcels built before 1914	Node	N	% Total Sample	% Chronic absence
Y		2	67	26.30%	34.30%
N	<=334	3	117	45.90%	7.70%
N	>334	4	71	27.80%	21.10%

Figure 16. Chronic absence by node (Grade 5).

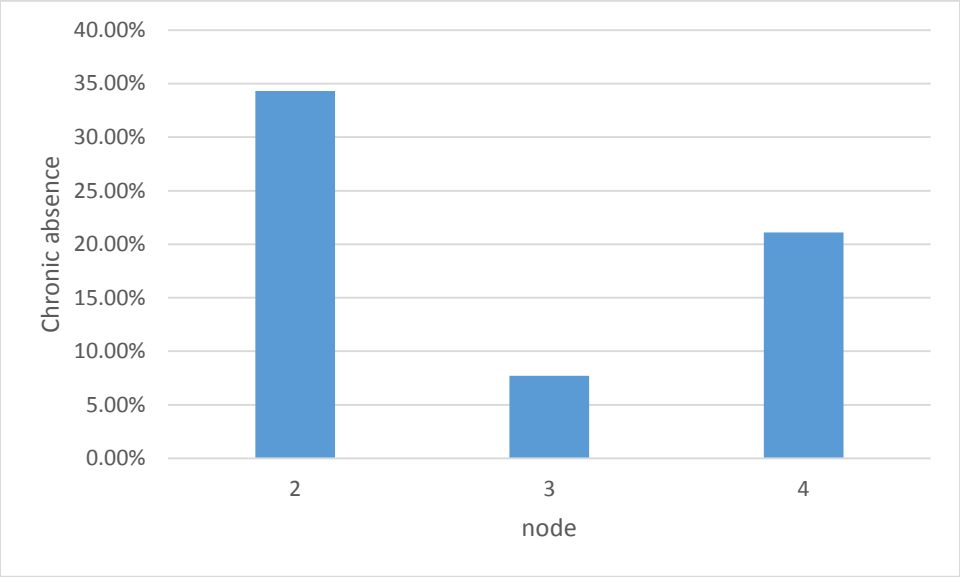
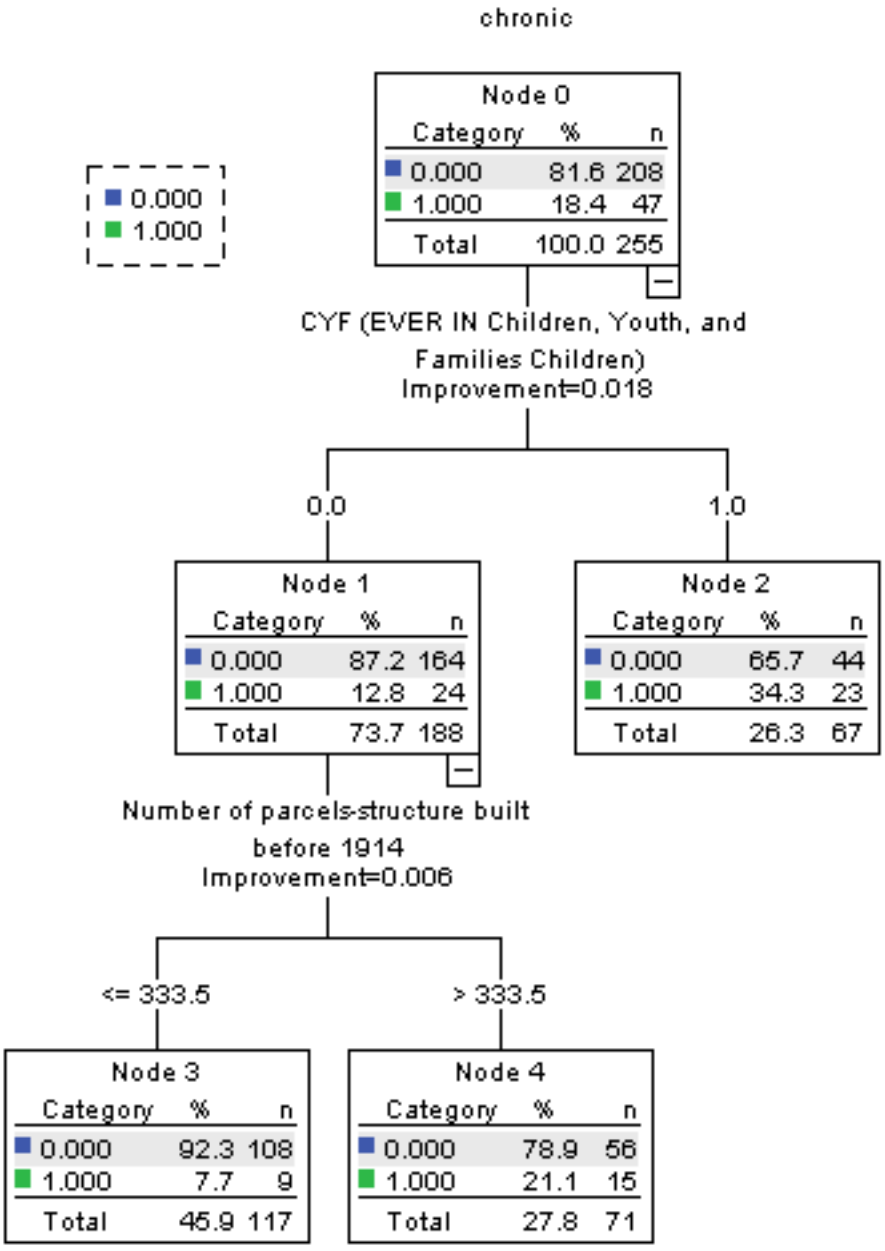


Figure 17. Tree Diagram (Grade 5).



3.9 Grade 6

- N = 271
- No predictor contributed to the classification of chronic absence (i.e., no child node, no importance table or tree diagram).
- Overall, 42 (15.5%) students were chronically absent.

3.10 Grade 7

- N = 250
- 1 predictor contributed to the classification of chronic absence. CART produced 2 child nodes.
- The predictors are: level-1, rankSuburb_Sum.
- Node 2 (also the largest node) had the highest levels of chronic absence (42.9%) which contained 64.4% of students who were in tracts with sum rank for suburb more than 1318.
- Node 1 had the lowest level of chronic absence (16.9%) which contained 35.6% of students who were in tracts with sum rank for suburb less or equal to 1318.
- Overall 66.4% of students were correctly classified.

Table 32. Importance table (Grade 7)

Independent Variable	Importance	Normalized Importance
RankSuburbs_Sum	0.031	100.00%
Medium house sales price in 2013	0.024	76.70%
Number of parcels-structure built before 1914	0.022	69.70%
% below poverty level	0.013	41.40%
homestead	0.011	35.20%
% black	0.006	18.40%
Sum of Total Delinquency in 2013	0.001	3.90%

Table 33. Chronic absence by node (Grade 7).

rankSuburbs_Sum	Node	N	% Total Sample	% Chronic absence
<=1318	1	89	35.60%	16.90%
>1318	2	161	64.40%	42.90%

Figure 18. Chronic absence by node (Grade 7).

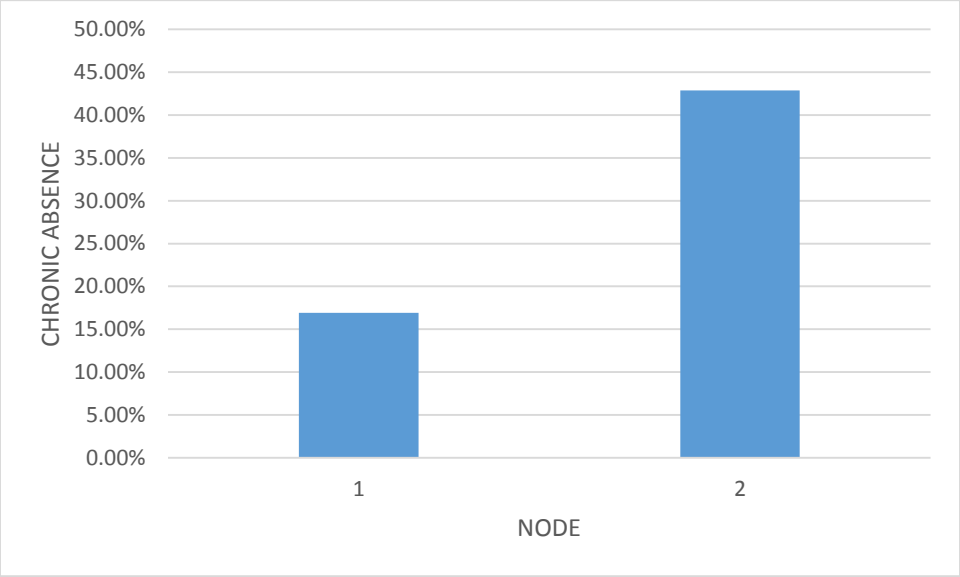
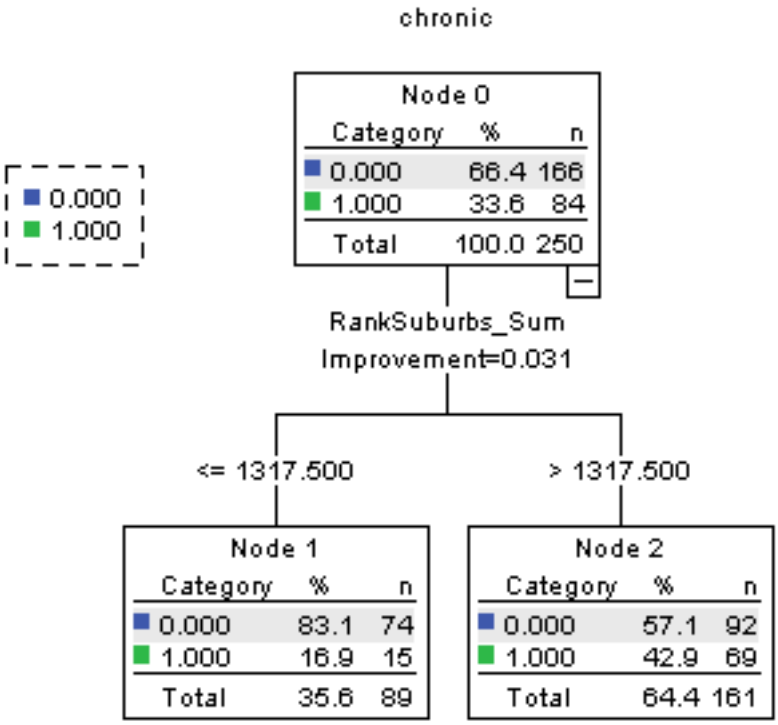


Figure 19. Tree Diagram (Grade 7).



3.11 Grade 8

- N = 305
- 3 predictors contributed to the classification of chronic absence. CART produced 6 child nodes.
- The predictors are: level-1, old for grade; level-2, medium house sales price in 2013; level-3, homestead.
- Node 2 had the highest levels of chronic absence (62.1%). Node 6 contained 21.6% of students who were not old for their grade.
- Node 5 had the lowest level of chronic absence (5.5%) which contained 23.9% of students who were not old for grade, in tracts with medium house sales price more than 25500, and stayed in a house with homestead.
- Overall 72.8% of students were correctly classified.

Table 34. Importance table (Grade 8)

Independent Variable	Importance	Normalized Importance
old for grade	0.049	100.00%
homestead	0.025	51.00%
Medium house sales price in 2013	0.018	37.70%
% black	0.015	30.40%
% below poverty level	0.015	30.40%
Number of parcels-structure built before 1914	0.013	26.70%
CYF (EVER IN Children, Youth, and Families Children)	0.013	26.00%
RankSuburbs_Sum	0.01	20.70%
DPW: if any of Department of Public Welfare-FS, SSI, and TNF	0.009	18.00%
MH (EVER IN Mental Health)	0.009	17.90%
School Move or not (1: Yes)	0.005	10.30%
Sum of Total Delinquency in 2013	0.004	8.40%
HH (EVER IN Hunger and Homeless)	0.001	1.60%
EI (EVER IN Early Intervention)	0.001	1.40%
FSC (EVER IN Family Support Center)	0	0.30%

Table 35. Chronic absence by node (Grade 8).

old for grade	medium house sales price in 2013	homestead	Node	N	% Total Sample	% Chronic absence
Y			2	66	21.60%	62.10%
N	<=25500		3	124	40.70%	34.70%
N	>25500	Y	5	73	23.90%	5.50%
N	>25500	N	6	42	13.80%	26.20%

Figure 20. Chronic absence by node (Grade 8).

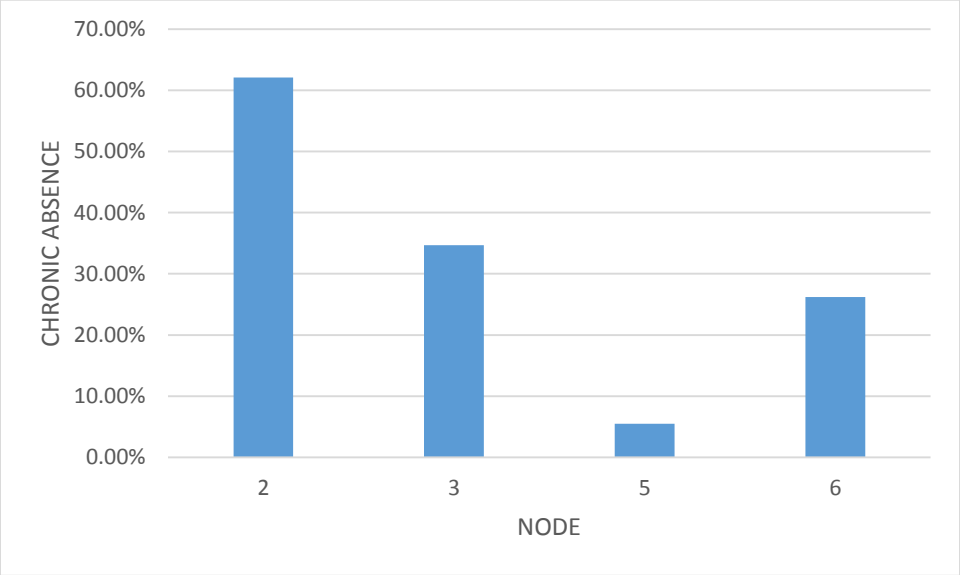
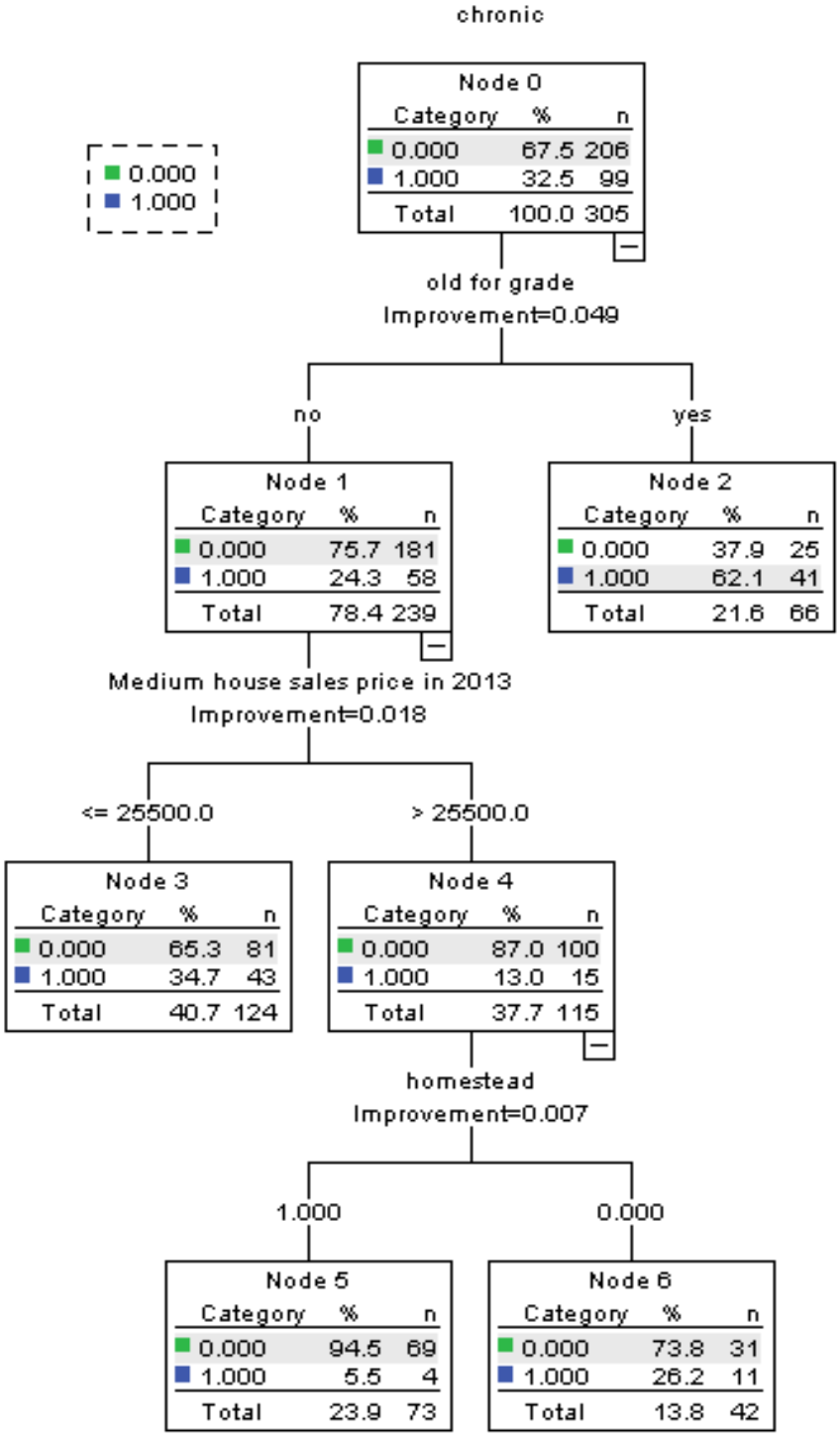


Figure 21. Tree Diagram (Grade 8).



3.12 Grade 9

- N = 289
- 2 predictors contributed to the classification of chronic absence. CART produced 4 child nodes.
- The predictors are: level-1, medium house sales price in 2013; level-2, Poverty (if any of department public welfare-FS, SSI and TNF).
- Node 3 had the highest levels of chronic absence (66.1%) which contained 19.4% of students who were in tracts with medium house sales price less or equal to 62050 and had child poverty (if any public welfare).
- Node 2 had the lowest level of chronic absence (13.4%) which contained 28.4% of students who were in tracts with medium house sales price in 2013 larger than 62050.
- The largest node, Node 4, had 52.2% of total students. Node 4 contained student who were in the tracts with medium house sales price in 2013 less or equal to 62050 and did not have poverty (any public welfare). For this node, 38.4% were identified as chronic absent.
- Overall 69.6% of students were correctly classified.

Table 36. Importance table (Grade 9)

Independent Variable	Importance	Normalized Importance
Medium house sales price in 2013	0.043	100.00%
Number of parcels-structure built before 1914	0.039	92.10%
% below poverty level	0.024	55.20%
Poverty: if any of Department of Public Welfare-FS, SSI, and TNF	0.022	50.40%
RankSuburbs_Sum	0.019	45.20%
% black	0.016	36.30%
MH (EVER IN Mental Health)	0.009	21.10%
HH (EVER IN Hunger and Homeless)	0.008	19.70%
CYF (EVER IN Children, Youth, and Families Children)	0.004	9.20%
Sum of Total Delinquency in 2013	0.002	4.00%
EI (EVER IN Early Intervention)	0.001	2.90%
HACP (EVER IN Housing Authority of City of Pittsburgh)	7.21E-05	0.20%

Table 37. Chronic absence by node (Grade 9).

Medium house sales price in 2013	Poverty (if any Public Welfare)	Node	N	% Total Sample	% Chronic absence
>62050		2	82	28.40%	13.40%
<=62050	Y	3	56	19.40%	66.10%
<=62050	N	4	151	52.20%	38.40%

Figure 22. Chronic absence by node (Grade 9).

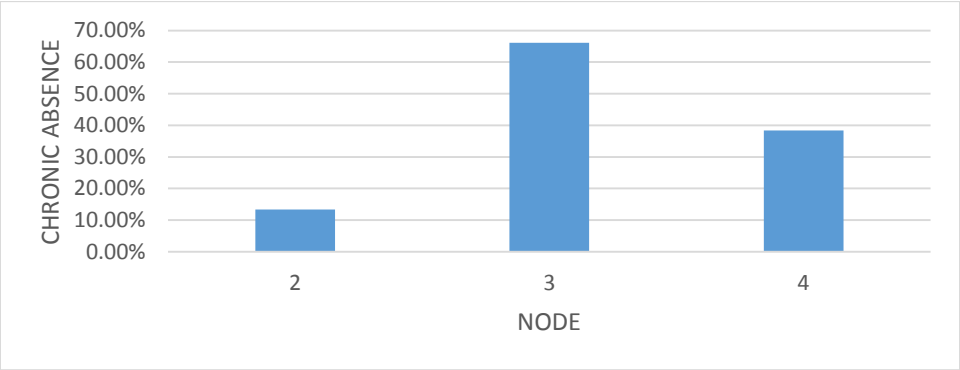
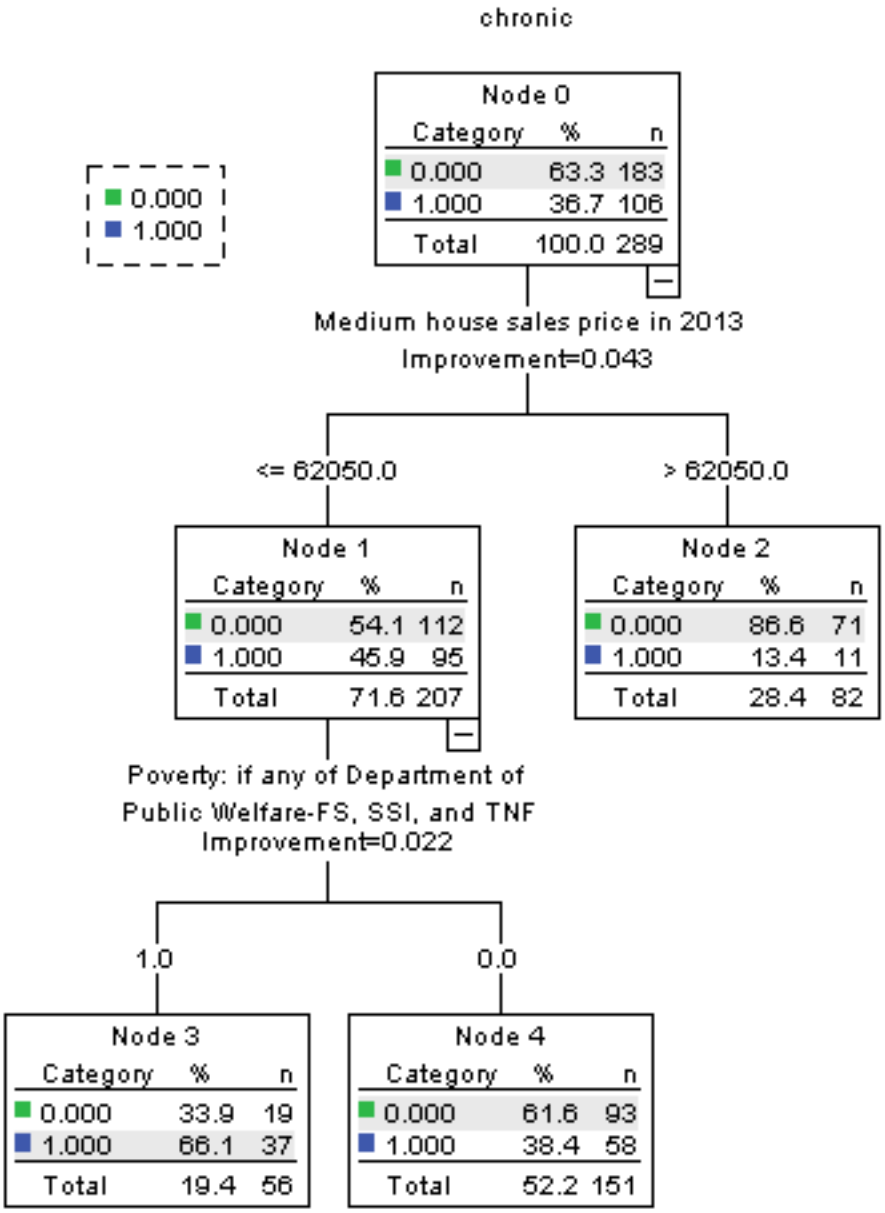


Figure 23. Tree Diagram (Grade 9).



3.13 Grade 10

- N = 282
- 3 predictors contributed to the classification of chronic absence. CART produced 6 child nodes.
- The predictors are: level-1, homestead; level-2, % below poverty level and medium house sales price in 2013.
- Node 4 (also the largest node) had the highest levels of chronic absence (57.7%). Node 4 contained 34.4% of students who did not live in a house with homestead and percent below poverty for the tract was more than 19.3.
- Node 6 had the lowest level of chronic absence (10.0%) which contained 17.7% of students who lived in a house with homestead and in the tract with medium house sales price more than 65825.
- Overall 69.5% of students were correctly classified.

Table 38. Importance table (Grade 10)

Independent Variable	Importance	Normalized Importance
% below poverty level	0.051	100.00%
Medium house sales price in 2013	0.036	70.80%
homestead	0.032	64.00%
Number of parcels-structure built before 1914	0.029	57.70%
% black	0.028	56.30%
RankSuburbs_Sum	0.025	49.10%
DPW: if any of Department of Public Welfare-FS, SSI, and TNF	0.017	33.30%
CYF (EVER IN Children, Youth, and Families Children)	0.013	26.00%
Sum of Total Delinquency in 2013	0.004	7.90%
EI (EVER IN Early Intervention)	0.003	6.40%

Table 39. Chronic absence by node (Grade 10).

homestead	% below poverty level	medium house sales price in 2013	Node	N	% Total Sample	% Chronic absence
N	<=19.3		3	57	20.20%	29.80%
N	>19.3		4	97	34.40%	57.70%
Y		<=65825	5	78	27.70%	29.50%
Y		>65825	6	50	17.70%	10.00%

Figure 24. Chronic absence by node (Grade 10).

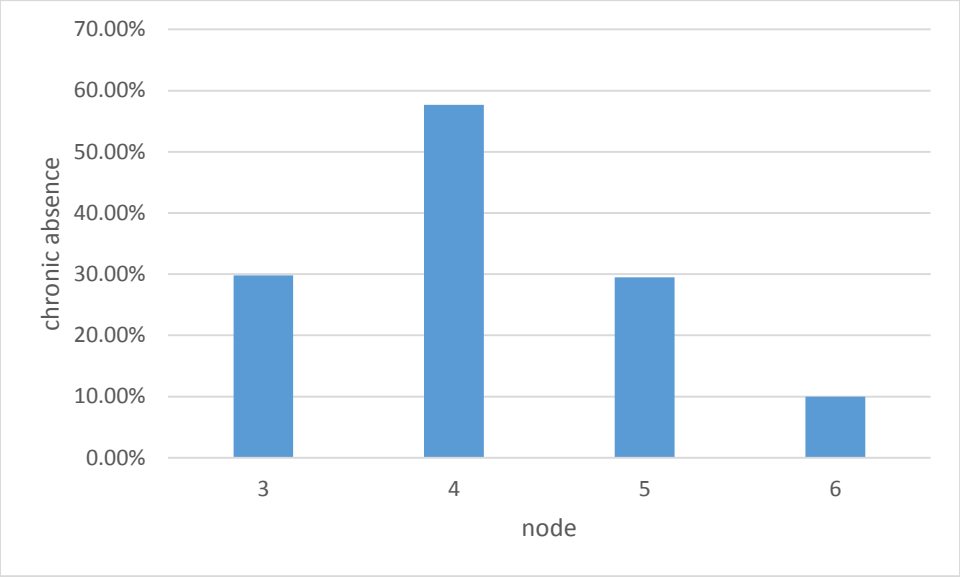
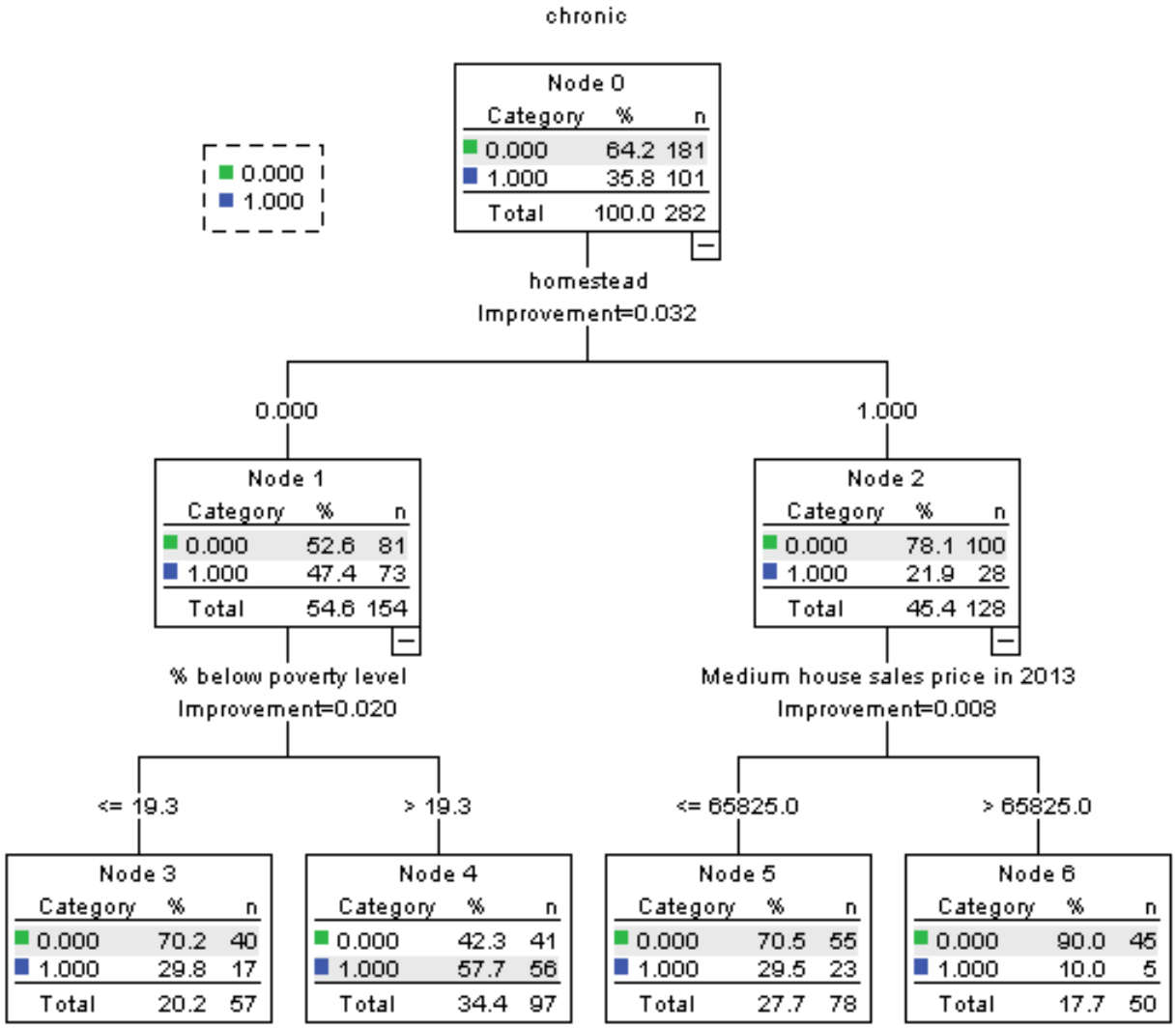


Figure 25. Tree Diagram (Grade 10).



3.14 Grade 11

- N = 247
- 2 predictors contributed to the classification of chronic absence. CART produced 4 child nodes.
- The predictors are: level-1, medium house sales price in 2013; level-2, sex.
- Node 3 (also the largest node) had the highest levels of chronic absence (59.0%) which contained 40.5% of female students who were in tracts with medium house sales price in 2013 less or equal to 62050.
- Node 2 had the lowest level of chronic absence (23.4%) which contained 25.9% of students who were in tracts with medium house sales price in 2013 more than 62050.
- Overall 62.3% of students were correctly classified.

Table 40. Importance table (Grade 11)

Independent Variable	Importance	Normalized Importance
Medium house sales price in 2013	0.032	100.00%
% below poverty level	0.029	90.00%
Number of parcels-structure built before 1914	0.025	78.20%
RankSuburbs_Sum	0.023	71.90%
sex	0.008	23.50%
% black	0.007	21.60%
MH (EVER IN Mental Health)	0.006	18.20%
old for grade	0	0.70%
Sum of Total Delinquency in 2013	4.18E-05	0.10%

Table 41. Chronic absence by node (Grade 11).

medium house sales price in 2013	sex	Node	N	% Total Sample	% Chronic absence
>62050		2	64	25.90%	23.40%
<=62050	F	3	100	40.50%	59.00%
<=62050	M	4	83	33.60%	44.60%

Figure 26. Chronic absence by node (Grade 11).

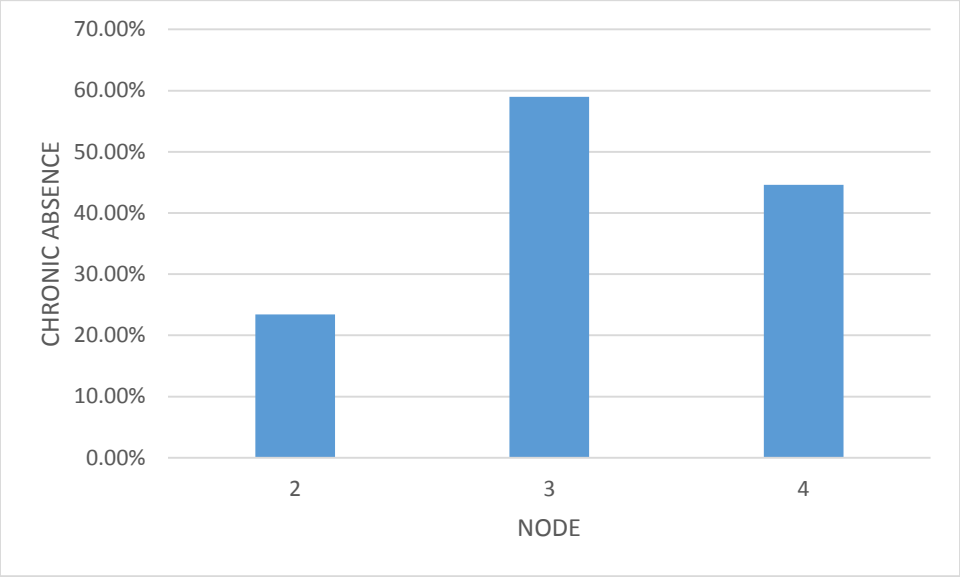
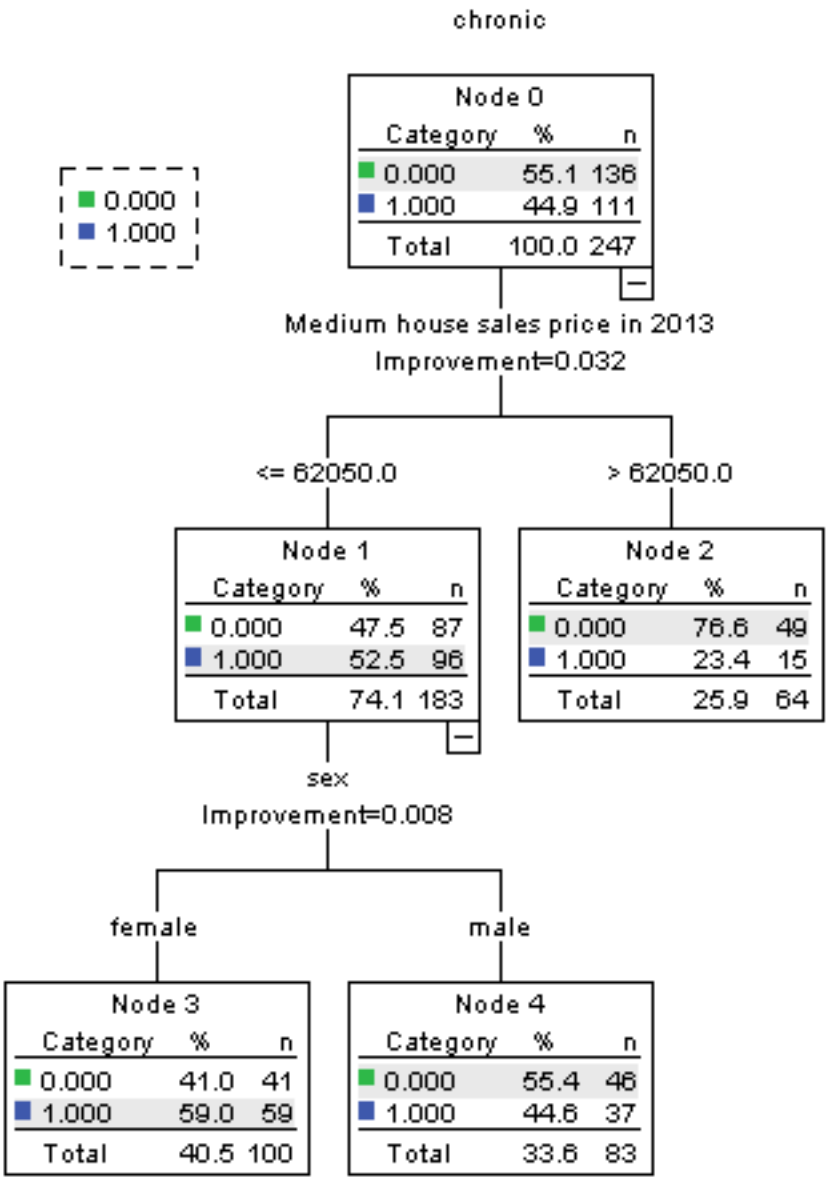


Figure 27. Tree Diagram (Grade 11).



3.15 Grade 12

- N = 263
- 1 predictor contributed to the classification of chronic absence. CART produced 2 child nodes.
- The predictors are: level-1, homestead
- Node 2 (also the largest node) had the highest levels of chronic absence (56.1%). Node 2 contained 50.2% of students who lived in a house without homestead.
- Node 1 had the lowest level of chronic absence (27.5%) which contained 49.8% of students who lived in a house with homestead.
- Overall 64.3% of students were correctly classified.

Table 42. Importance table (Grade 12)

Independent Variable	Importance	Normalized Importance
homestead	0.041	100.00%
Medium house sales price in 2013	0.033	80.30%
RankSuburbs_Sum	0.033	80.30%
Number of parcels-structure built before 1914	0.027	65.70%
% below poverty level	0.025	62.40%
old for grade	0.019	46.80%
CYF (EVER IN Children, Youth, and Families Children)	0.015	37.60%
DPW: if any of Department of Public Welfare-FS, SSI, and TNF	0.014	34.00%
School Move or not (1: Yes)	0.013	32.10%
% black	0.011	25.80%
HACP (EVER IN Housing Authority of City of Pittsburgh)	0.01	25.60%
MH (EVER IN Mental Health)	0.01	24.30%
FSC (EVER IN Family Support Center)	0.007	17.70%
HH (EVER IN Hunger and Homeless)	0.004	10.70%
Sum of Total Delinquency in 2013	0.004	10.40%
sex	0.004	10.10%
EI (EVER IN Early Intervention)	0	0.50%

Table 43. Chronic absence by node (Grade 12).

homestead	Node	N	% Total Sample	% Chronic absence
Y	1	131	49.80%	27.50%
N	2	132	50.20%	56.10%

Figure 28. Chronic absence by node (Grade 12).

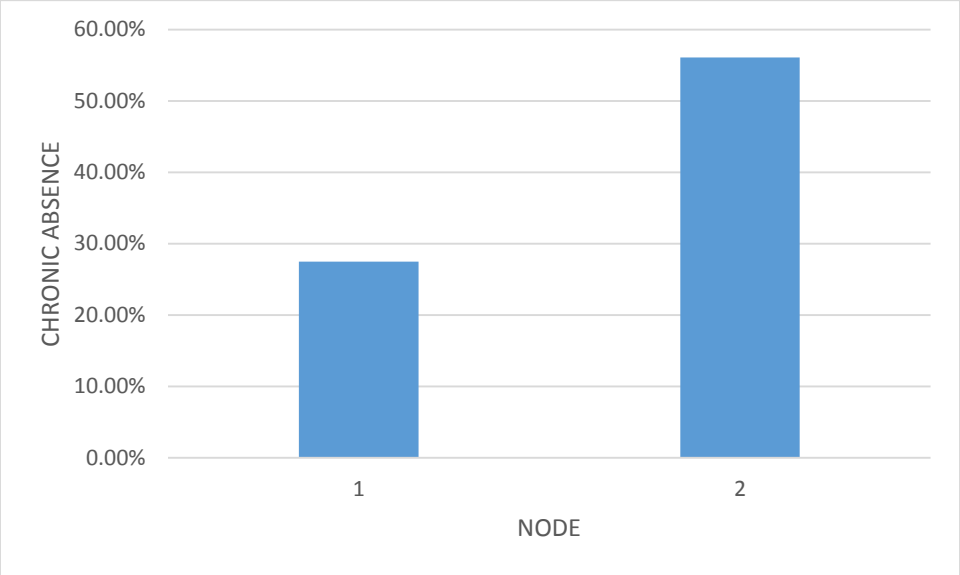
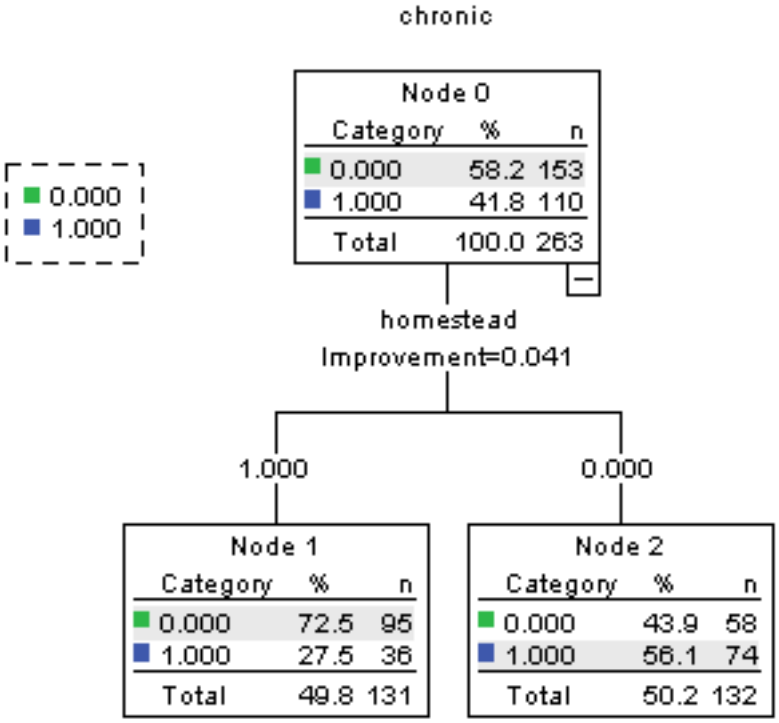
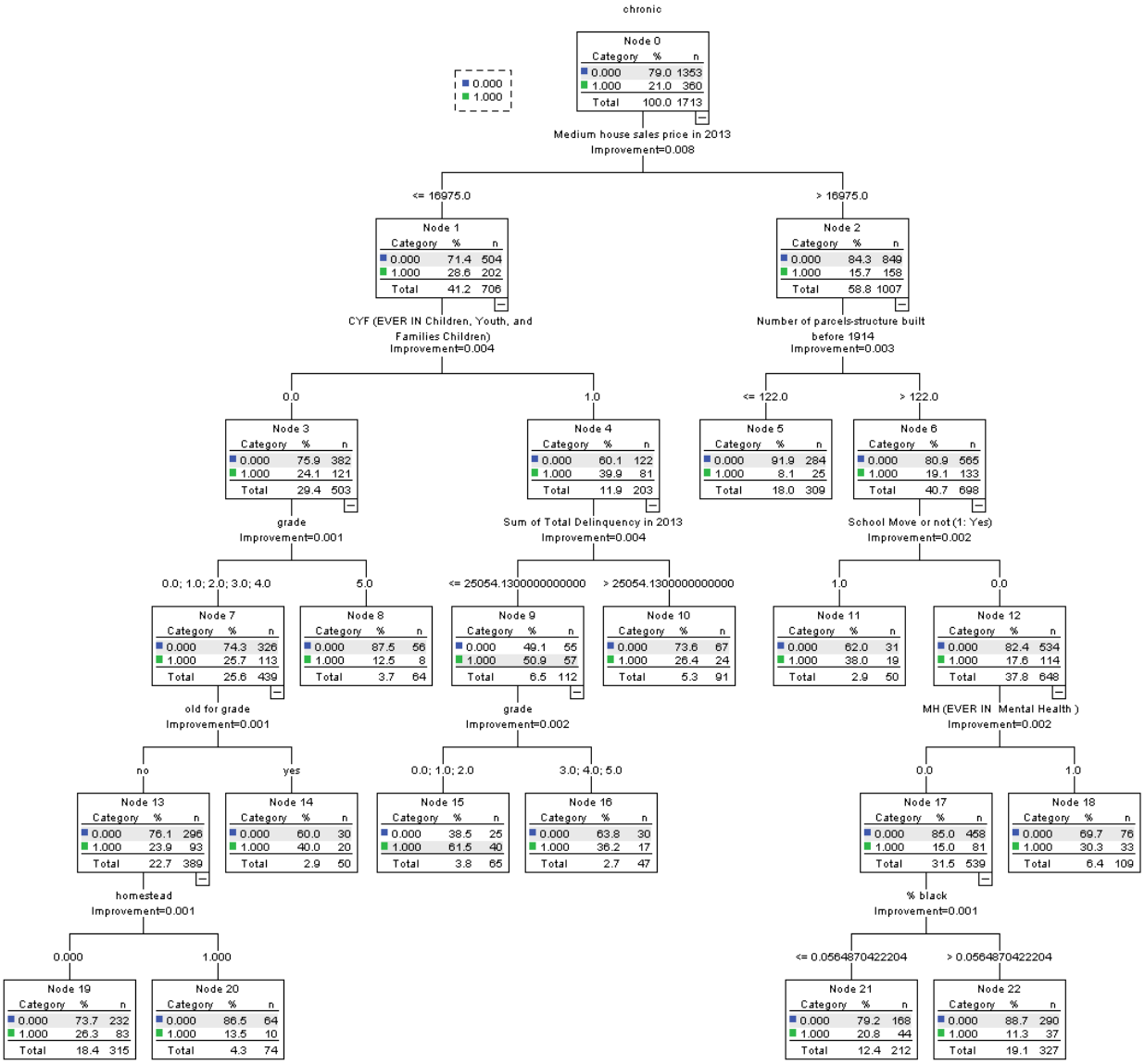


Figure 29. Tree Diagram (Grade 12).

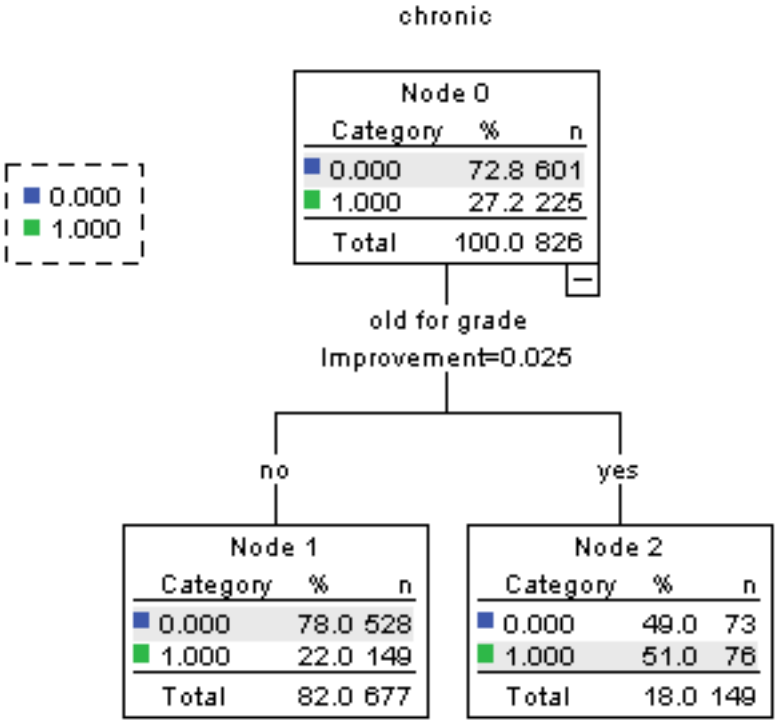
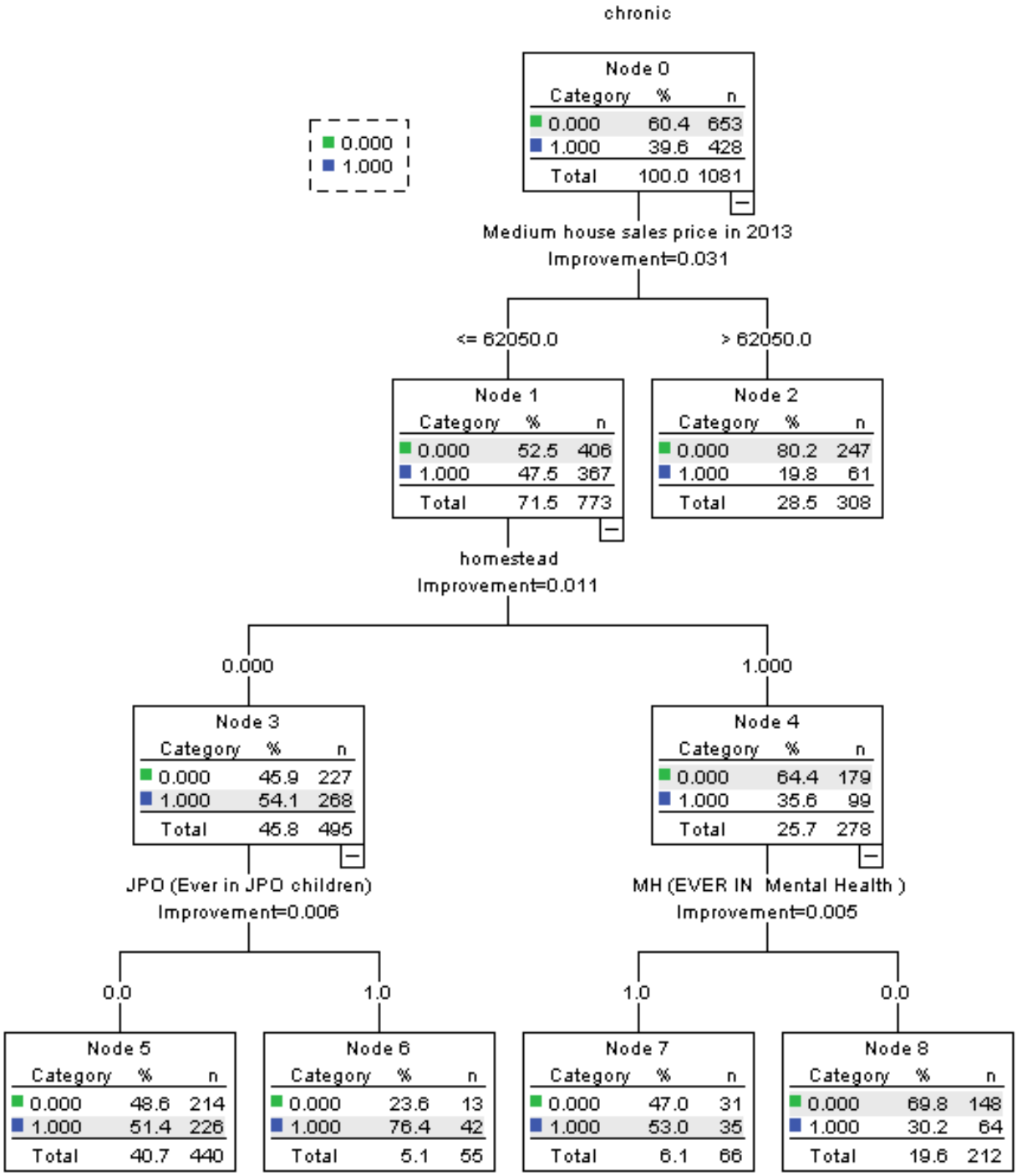


The CART model was also performed for grade groups for Woodland Hills.

Woodland Hills Grades K-5



Woodland Hills Grades 6-8



Woodland Hills Grades 9-12