# Drawing Conclusions

* Which risk factors are associated with hypertension? Do these associations hold with and without the survey design information (survey weight, bootstrap weights, specifying the 11 degrees of freedom)?

Main Effects and Quadratic Terms

For each row, H0: Parameter = 0

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| |  |  |  | | --- | --- | --- | | |  | | --- | | Variable Estimate `Weighted Estimate` p\_value `Weighted p\_value` `Design Effect`  *<chr>* *<dbl>* *<dbl>* *<dbl>* *<dbl>* *<dbl>*  1 (Intercept) 1.70 1.44 NA NA 1.42  2 SMK\_122 0.397 0.233 NA NA 0.882  3 SMK\_123 -0.0143 0.00312 1.13e- 1 4.72e- 1 0.948  4 CLC\_SEX 0.257 0.263 1.15e- 3 5.25e- 3 1.14  5 CLC\_AGE -0.0476 -0.0466 1.48e-95 4.37e-26 1.06  6 HWMDBMI 0.0555 0.0644 1.67e- 1 2.92e- 1 1.50  7 LAB\_BCD -0.00926 0.00487 4.61e- 1 8.01e- 1 1.59  8 LAB\_BHG -0.0103 -0.00464 9.48e- 2 5.83e- 1 1.38  9 I(HWMDBMI^2) -0.00133 -0.00150 3.91e- 2 1.43e- 1 1.55  10 I(LAB\_BCD^2) 0.000154 -0.000232 6.60e- 1 6.86e- 1 1.66  11 I(LAB\_BHG^2) 0.0000924 -0.00000471 3.52e- 1 9.71e- 1 1.43  12 HWMDBMI + HWMDBMI^2 NA NA 1.83e- 6 2.37e- 3 NA  13 LAB\_BCD + LAB\_BCD^2 NA NA 5.05e- 1 7.31e- 1 NA  14 LAB\_BHG + LAB\_BHG^2 NA NA 4.79e- 2 1.85e- 1 NA | |  | | |

There is very strong evidence that CLC\_AGE for both unweighted and weighted models, and HWMDBMI for unweighted model affect mean HIGHBP, even after other effects have been taken into account.

There is strong evidence that CLC\_SEX for both models, and HWMDBMI for weighted model, affect mean HIGHBP.

There is some evidence that LAB\_BHG effects mean HIGHBP, but only for unweighted model.

There is inconclusive evidence whether other variables influence mean HIGHBP.

* Does the prevalence of hypertension and selected risk factors vary between men and women?  Across age groups?  How does your interpretation of these results change when the analysis is run with and without the survey design information?

Main Effects, Quadratics, and Sex Interaction Terms

For each row, H0: Parameter = 0

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| Variable Estimate `Weighted Estimate` p\_value `Weighted p\_value` `Design Effect`  *<chr>* *<dbl>* *<dbl>* *<dbl>* *<dbl>* *<dbl>*  1 (Intercept) -0.162 -0.460 NA NA 1.33  2 SMK\_122 1.02 0.683 NA NA 1.17  3 SMK\_123 0.258 0.00778 0.355 0.657 1.14  4 CLC\_SEX 1.51 1.56 0.00141 NA 1.01  5 CLC\_AGE -0.0372 -0.0344 0.000000900 0.000000756 0.798  6 HWMDBMI 0.0878 0.101 0.0458 0.150 1.56  7 LAB\_BCD -0.00214 0.0169 0.889 0.568 1.93  8 LAB\_BHG -0.00695 -0.00167 0.437 0.866 1.16  9 I(HWMDBMI^2) -0.00132 -0.00144 0.0416 0.153 1.52  10 I(LAB\_BCD^2) 0.000225 -0.000149 0.532 0.780 1.52  11 I(LAB\_BHG^2) 0.0000937 -0.00000550 0.344 0.966 1.39  12 SMK\_122:CLC\_SEX -0.400 -0.296 NA NA 1.14  13 SMK\_123:CLC\_SEX -0.186 -0.00588 0.601 0.820 1.08  14 CLC\_SEX:CLC\_AGE -0.00687 -0.00812 0.163 0.100 0.978  15 CLC\_SEX:HWMDBMI -0.0219 -0.0259 0.0555 0.132 1.47  16 CLC\_SEX:LAB\_BCD -0.00631 -0.00989 0.401 0.398 1.55  17 CLC\_SEX:LAB\_BHG -0.00217 -0.00187 0.615 0.609 0.852  18 HWMDBMI + HWMDBMI^2 NA NA 0.118 0.240 NA  19 LAB\_BCD + LAB\_BCD^2 NA NA 0.770 0.751 NA  20 LAB\_BHG + LAB\_BHG^2 NA NA 0.625 0.968 NA |
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| There is some evidence that CLC\_SEX:HWMDBMI influences mean HIGHBP for unweighted model.  It is inconclusive whether other interaction terms influence mean HIGHBP.  Main Effects, Quadratics, and Age Interaction Terms  For each row, H0: Parameter = 0  Variable Estimate `Weighted Estimate` p\_value `Weighted p\_value` `Design Effect`  *<chr>* *<dbl>* *<dbl>* *<dbl>* *<dbl>* *<dbl>*  1 (Intercept) 1.37 1.67 NA NA 1.45  2 SMK\_122 0.121 -0.0917 NA NA 1.16  3 SMK\_123 0.680 0.470 0.129 0.383 0.945  4 CLC\_SEX 0.616 0.687 0.0159 0.00115 0.775  5 CLC\_AGE -0.0411 -0.0520 0.00394 NA 1.43  6 HWMDBMI 0.0339 0.0302 0.440 0.633 1.45  7 LAB\_BCD -0.0174 -0.0103 0.278 0.675 1.56  8 LAB\_BHG -0.0117 -0.00463 0.193 0.645 1.13  9 I(HWMDBMI^2) -0.00131 -0.00151 0.0425 0.140 1.54  10 I(LAB\_BCD^2) 0.0000905 -0.000323 0.799 0.570 1.61  11 I(LAB\_BHG^2) 0.0000876 -0.00000763 0.377 0.954 1.42  12 SMK\_122:CLC\_AGE 0.00487 0.00670 NA NA 1.18  13 SMK\_123:CLC\_AGE -0.0138 -0.00973 0.0424 0.229 1.000  14 CLC\_SEX:CLC\_AGE -0.00737 -0.00922 0.134 0.0373 0.870  15 CLC\_AGE:HWMDBMI 0.000415 0.000744 0.231 0.103 1.28  16 CLC\_AGE:LAB\_BCD 0.000213 0.000394 0.362 0.0594 0.868  17 CLC\_AGE:LAB\_BHG 0.0000340 0.00000220 0.799 0.975 0.575  18 HWMDBMI + HWMDBMI^2 NA NA 0.00442 0.0184 NA  19 LAB\_BCD + LAB\_BCD^2 NA NA 0.463 0.338 NA  20 LAB\_BHG + LAB\_BHG^2 NA NA 0.428 0.730 NA   |  | | --- | |  | |
| There is some evidence that SMK:CLC\_AGE for the unweighted model only, and CLC\_SEX:CLC\_AGE and CLC\_AGE:LAB\_BCD for  meighted model only effect mean HIGHBP.   * How would you summarize the impact of including and not including the survey design information in your analysis?  Did you see a greater impact for certain estimates and not others?   We look at the design affects for additional insight.  Main Effects and Quadratic Terms  For each row, H0: Parameter = 0   |  | | --- | |  | |  | | |  |  |  | | --- | --- | --- | | |  | | --- | | Variable Estimate `Weighted Estimate` p\_value `Weighted p\_value` `Design Effect`  *<chr>* *<dbl>* *<dbl>* *<dbl>* *<dbl>* *<dbl>*  1 (Intercept) 1.70 1.44 NA NA 1.42  2 SMK\_122 0.397 0.233 NA NA 0.882  3 SMK\_123 -0.0143 0.00312 1.13e- 1 4.72e- 1 0.948  4 CLC\_SEX 0.257 0.263 1.15e- 3 5.25e- 3 1.14  5 CLC\_AGE -0.0476 -0.0466 1.48e-95 4.37e-26 1.06  6 HWMDBMI 0.0555 0.0644 1.67e- 1 2.92e- 1 1.50  7 LAB\_BCD -0.00926 0.00487 4.61e- 1 8.01e- 1 1.59  8 LAB\_BHG -0.0103 -0.00464 9.48e- 2 5.83e- 1 1.38  9 I(HWMDBMI^2) -0.00133 -0.00150 3.91e- 2 1.43e- 1 1.55  10 I(LAB\_BCD^2) 0.000154 -0.000232 6.60e- 1 6.86e- 1 1.66  11 I(LAB\_BHG^2) 0.0000924 -0.00000471 3.52e- 1 9.71e- 1 1.43  12 HWMDBMI + HWMDBMI^2 NA NA 1.83e- 6 2.37e- 3 NA  13 LAB\_BCD + LAB\_BCD^2 NA NA 5.05e- 1 7.31e- 1 NA  14 LAB\_BHG + LAB\_BHG^2 NA NA 4.79e- 2 1.85e- 1 NA | |  | | |   Since most of the Design Effects are greater than 1, most of the weighted variances are greater than the unweighted  variances. Smoking status (SMK) is the exception.  The terms that contain quadratic terms have especially large weighted variances. |
| Main Effects, Quadratics, and Sex Interaction Terms  For each row, H0: Parameter = 0   |  | | --- | | Variable Estimate `Weighted Estimate` p\_value `Weighted p\_value` `Design Effect`  *<chr>* *<dbl>* *<dbl>* *<dbl>* *<dbl>* *<dbl>*  1 (Intercept) -0.162 -0.460 NA NA 1.33  2 SMK\_122 1.02 0.683 NA NA 1.17  3 SMK\_123 0.258 0.00778 0.355 0.657 1.14  4 CLC\_SEX 1.51 1.56 0.00141 NA 1.01  5 CLC\_AGE -0.0372 -0.0344 0.000000900 0.000000756 0.798  6 HWMDBMI 0.0878 0.101 0.0458 0.150 1.56  7 LAB\_BCD -0.00214 0.0169 0.889 0.568 1.93  8 LAB\_BHG -0.00695 -0.00167 0.437 0.866 1.16  9 I(HWMDBMI^2) -0.00132 -0.00144 0.0416 0.153 1.52  10 I(LAB\_BCD^2) 0.000225 -0.000149 0.532 0.780 1.52  11 I(LAB\_BHG^2) 0.0000937 -0.00000550 0.344 0.966 1.39  12 SMK\_122:CLC\_SEX -0.400 -0.296 NA NA 1.14  13 SMK\_123:CLC\_SEX -0.186 -0.00588 0.601 0.820 1.08  14 CLC\_SEX:CLC\_AGE -0.00687 -0.00812 0.163 0.100 0.978  15 CLC\_SEX:HWMDBMI -0.0219 -0.0259 0.0555 0.132 1.47  16 CLC\_SEX:LAB\_BCD -0.00631 -0.00989 0.401 0.398 1.55  17 CLC\_SEX:LAB\_BHG -0.00217 -0.00187 0.615 0.609 0.852  18 HWMDBMI + HWMDBMI^2 NA NA 0.118 0.240 NA  19 LAB\_BCD + LAB\_BCD^2 NA NA 0.770 0.751 NA  20 LAB\_BHG + LAB\_BHG^2 NA NA 0.625 0.968 NA | |

Again, we see that most design affects are greater than 1. Not sure what the explanation is for differences in design effects.

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| Main Effects, Quadratics, and Age Interaction Terms  For each row, H0: Parameter = 0  Variable Estimate `Weighted Estimate` p\_value `Weighted p\_value` `Design Effect`  *<chr>* *<dbl>* *<dbl>* *<dbl>* *<dbl>* *<dbl>*  1 (Intercept) 1.37 1.67 NA NA 1.45  2 SMK\_122 0.121 -0.0917 NA NA 1.16  3 SMK\_123 0.680 0.470 0.129 0.383 0.945  4 CLC\_SEX 0.616 0.687 0.0159 0.00115 0.775  5 CLC\_AGE -0.0411 -0.0520 0.00394 NA 1.43  6 HWMDBMI 0.0339 0.0302 0.440 0.633 1.45  7 LAB\_BCD -0.0174 -0.0103 0.278 0.675 1.56  8 LAB\_BHG -0.0117 -0.00463 0.193 0.645 1.13  9 I(HWMDBMI^2) -0.00131 -0.00151 0.0425 0.140 1.54  10 I(LAB\_BCD^2) 0.0000905 -0.000323 0.799 0.570 1.61  11 I(LAB\_BHG^2) 0.0000876 -0.00000763 0.377 0.954 1.42  12 SMK\_122:CLC\_AGE 0.00487 0.00670 NA NA 1.18  13 SMK\_123:CLC\_AGE -0.0138 -0.00973 0.0424 0.229 1.000  14 CLC\_SEX:CLC\_AGE -0.00737 -0.00922 0.134 0.0373 0.870  15 CLC\_AGE:HWMDBMI 0.000415 0.000744 0.231 0.103 1.28  16 CLC\_AGE:LAB\_BCD 0.000213 0.000394 0.362 0.0594 0.868  17 CLC\_AGE:LAB\_BHG 0.0000340 0.00000220 0.799 0.975 0.575  18 HWMDBMI + HWMDBMI^2 NA NA 0.00442 0.0184 NA  19 LAB\_BCD + LAB\_BCD^2 NA NA 0.463 0.338 NA  20 LAB\_BHG + LAB\_BHG^2 NA NA 0.428 0.730 NA   |  | | --- | |  | |

Here, we see that design affects tend to be smaller than 1.