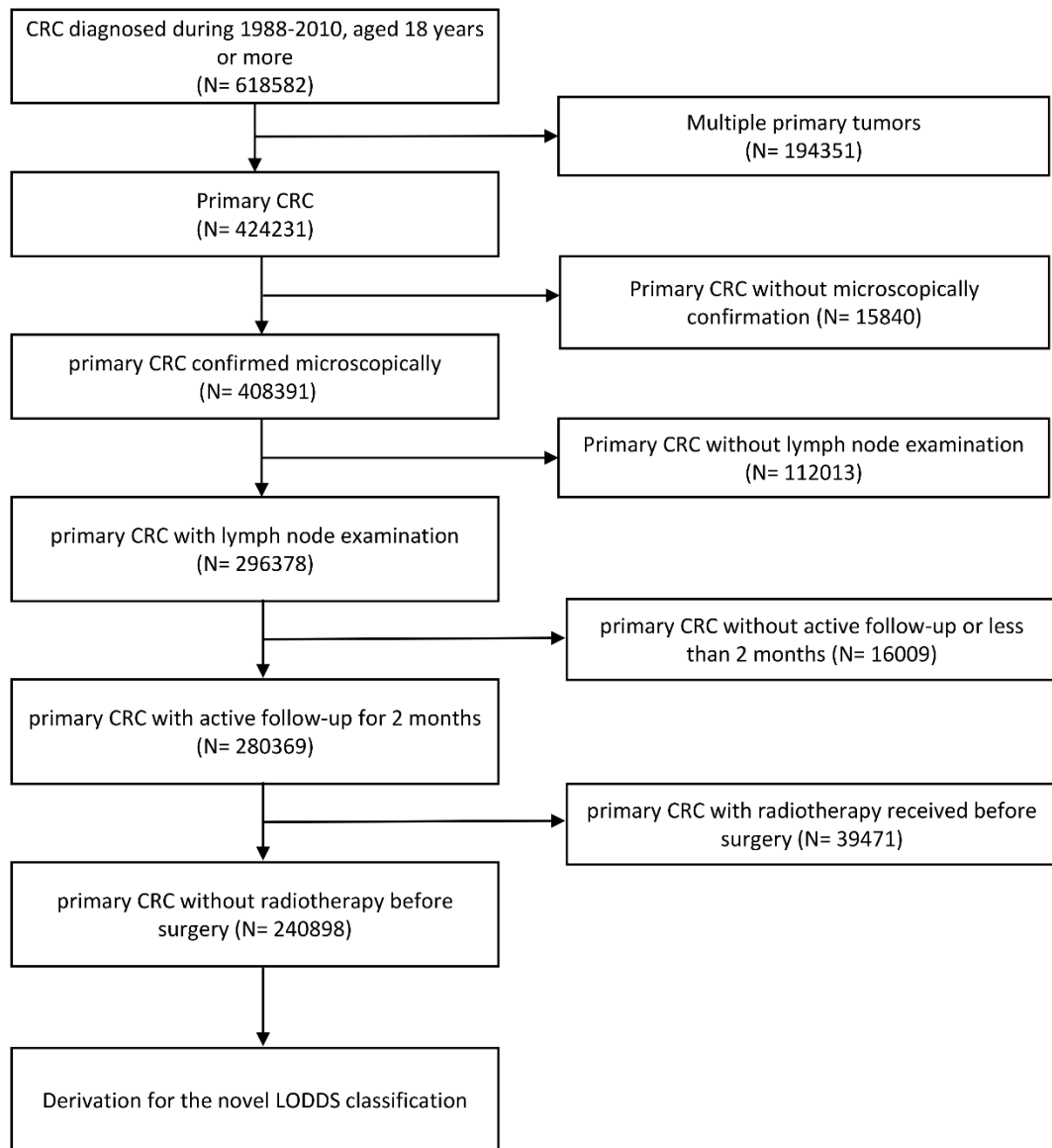
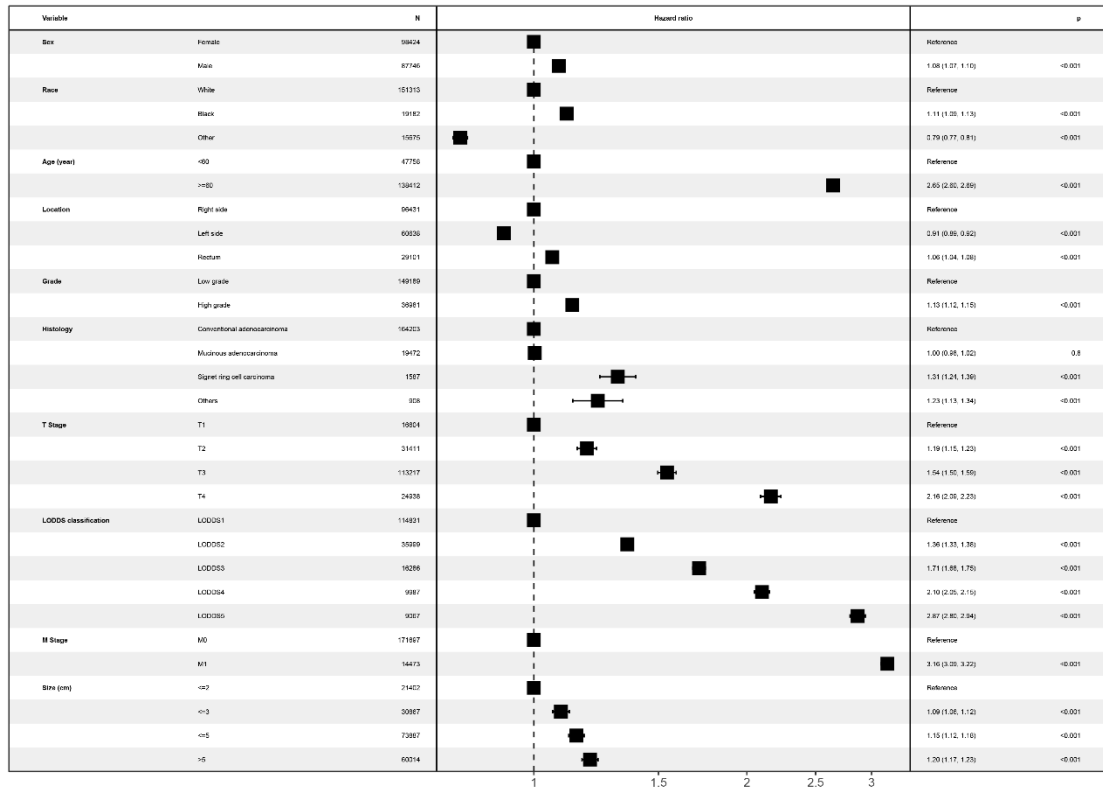


## Appendix 1



Supplementary Figure 1. Flow chart of selection of patients with colorectal cancer for derivation of the novel log odds of positive lymph nodes classification using the Surveillance, Epidemiology, and End Results database.

## Appendix 2



Supplementary Figure 2. Forest plot showing results of multivariate Cox regression model for exploring potential risk factors with inclusion of covariate log odds of positive lymph nodes for overall survival in 240,898 patients of the Surveillance, Epidemiology, and End Results database.

### Appendix 3

Supplementary Table 1. Results of competing risks regression with inclusion of the covariate log odds of positive lymph nodes in 240, 898 patients of the Surveillance, Epidemiology, and End Results database.

| Factor                      | SHR              | P      |
|-----------------------------|------------------|--------|
| <b>LODDS classification</b> |                  |        |
| LODDS1                      | 1 (Reference)    |        |
| LODDS2                      | 2.14 (2.10-2.19) | <0.001 |
| LODDS3                      | 3.65 (3.56-3.75) | <0.001 |
| <b>Sex</b>                  |                  |        |
| Female                      | 1 (Reference)    |        |
| Male                        | 1.06 (1.04-1.07) | <0.001 |
| <b>Race</b>                 |                  |        |
| White                       | 1 (Reference)    |        |
| Black                       | 1.21 (1.18-1.24) | <0.001 |
| Others                      | 0.87 (0.84-0.90) | <0.001 |
| <b>Age</b>                  |                  |        |
| < 60                        | 1 (Reference)    |        |
| >= 60                       | 1.34 (1.31-1.37) | <0.001 |
| <b>Location</b>             |                  |        |
| Proximal                    | 1 (Reference)    |        |
| Distal                      | 0.97 (0.95-0.99) | 0.002  |
| Rectum                      | 1.19 (1.16-1.22) | <0.001 |
| <b>Grade</b>                |                  |        |
| Low grade                   | 1 (Reference)    |        |
| High grade                  | 1.22 (1.19-1.25) | <0.001 |
| <b>Histology</b>            |                  |        |
| Adenocarcinoma              | 1 (Reference)    |        |
| Mucinous adenocarcinoma     | 0.99 (0.97-1.03) | 0.692  |
| Signet ring cell carcinoma  | 1.19 (1.10-1.30) | <0.001 |
| Others                      | 1.33 (1.17-1.52) | <0.001 |
| <b>T stage</b>              |                  |        |
| T1                          | 1 (Reference)    |        |
| T2                          | 1.56 (1.46-1.66) | <0.001 |
| T3                          | 3.09 (2.91-3.29) | <0.001 |
| T4                          | 4.97 (4.67-5.30) | <0.001 |
| <b>M stage</b>              |                  |        |
| M0                          | 1 (Reference)    |        |
| M1                          | 3.41 (3.43-3.50) | <0.001 |
| <b>Size</b>                 |                  |        |
| <=2                         | 1 (Reference)    |        |
| <=3                         | 1.10 (1.05-1.14) | <0.001 |
| <=5                         | 1.17 (1.12-1.21) | <0.001 |
| >5                          | 1.22 (1.18-1.28) | <0.001 |

LODDS: log odds of positive lymph nodes; pN: number of positive lymph node.

#### Appendix 4

Supplementary Table 2. Review of literature including all studies which showed statistical significance of LODDS in colorectal cancer.

| Author           | Year | No. of patients | Tumor location | Stage | LODDS classification      | Statistics |
|------------------|------|-----------------|----------------|-------|---------------------------|------------|
| Wang (SEER) (20) | 2008 | 24477           | Colon          | III   | -2.2, -1.1, 0, 1.1        | No         |
| Song (23)        | 2011 | 1297            | Colorectal     | I-III | -2.51, -1.68, -0.51, 0.73 | Yes        |
| Persiani (14)    | 2012 | 258             | colon          | I-IV  | -1.36, -0.53              | Yes        |
| Arslan (22)      | 2014 | 558             | Colon          | I-III | -1.36, -0.53              | No         |
| Fang (21)        | 2017 | 192             | Colorectal     | I-III | -0.82, -0.57              | Yes        |

LODDS: log odds of positive lymph nodes; SEER: Surveillance, Epidemiology, and End Results database.