Socioeconomic disparities in Endometrial Cancer survival in Germany: A survival analysis using population-based cancer registry data.

Bedir, Ahmed¹; Abera, Semaw Ferede¹; Vordermark, Dirk¹,²; Medenwald, Daniel¹,²

1. Department of Radiation Oncology, Health Services Research Group, University Hospital Halle (Saale), Ernst-Grube-Str. 40, 06120, Halle (Saale), Germany.
2. Department of Radiation Oncology, University Hospital Halle (Saale), Ernst-Grube-Str. 40, 06120, Halle (Saale), Germany.

Acknowledgments: None.

Address for correspondence:
Daniel Medenwald
Department of Radiation Oncology, University Hospital Halle (Saale), Ernst-Grube-Str. 40, 06120, Halle (Saale), Germany.
Telephone no: +49-345-557-3453/4027
Email: Daniel.Medenwald@uk-halle.de
### Appendix 2: Missing Treatment information: Sensitivity Analysis

Table 1. Characteristics of patients diagnosed with endometrial cancer 2004-2014 according to socioeconomic deprivation quintiles (missing treatment was considered as “not received”).

|                         | All patients | Least Deprived | 2       | 3       | 4       | Most Deprived |
|-------------------------|--------------|----------------|---------|---------|---------|--------------|
| Number of patients      | 31596        | 3971           | 6019    | 5544    | 7072    | 8990         |
| Alive at end of follow-up (%) | 22141 (70.1) | 2870 (72.3)    | 4304 (71.5) | 3846 (69.4) | 4917 (69.5) | 6204 (69.0) |
| Mean age at diagnosis (SD) | 67.7 (11.3)  | 67.0 (11.4)    | 67.1 (11.5) | 67.2 (11.6) | 68.1 (11.2) | 68.2 (11.1)  |
| Period of Diagnosis (%)  |              |                |         |         |         |              |
| 2004-2008               | 11943 (37.8) | 1472 (37.1)    | 2066 (34.3) | 1739 (31.4) | 2752 (38.9) | 3914 (43.5)  |
| 2009-2013               | 19653 (62.2) | 2499 (62.9)    | 3953 (65.7) | 3805 (68.6) | 4320 (61.1) | 5076 (56.5)  |
| Type (%)                |              |                |         |         |         |              |
| Low grade               | 24982 (79.1) | 3046 (76.7)    | 4668 (77.6) | 4312 (77.8) | 5689 (80.4) | 7267 (80.8)  |
| High grade              | 6614 (20.9)  | 925 (23.3)     | 1351 (22.4) | 1232 (22.2) | 1383 (19.6) | 1723 (19.2)  |
| Grade (%)               |              |                |         |         |         |              |
| I                       | 11623 (36.8) | 1234 (31.1)    | 1997 (33.2) | 2021 (36.5) | 2674 (37.8) | 3697 (41.1)  |
| II                      | 13658 (43.2) | 1855 (46.7)    | 2724 (45.3) | 2331 (42.0) | 3096 (43.8) | 3652 (40.6)  |
| III                     | 6315 (20.0)  | 882 (22.2)     | 1298 (21.6) | 1192 (21.5) | 1302 (18.4) | 1641 (18.3)  |
| Stage at Diagnosis (%)  |              |                |         |         |         |              |
| I                       | 13269 (42.0) | 1338 (33.7)    | 2182 (36.3) | 1668 (30.1) | 3370 (47.7) | 4711 (52.4)  |
| II                      | 1410 (4.5)   | 158 (4.0)      | 227 (3.8)  | 186 (3.4)  | 327 (4.6)  | 512 (5.7)    |
| III                     | 1816 (5.7)   | 231 (5.8)      | 366 (6.1)  | 254 (4.6)  | 394 (5.6)  | 571 (6.4)    |
| IV                      | 726 (2.3)    | 109 (2.7)      | 149 (2.5)  | 113 (2.0)  | 151 (2.1)  | 204 (2.3)    |
| Missing                 | 14375 (45.5) | 2135 (53.8)    | 3095 (51.4) | 3323 (59.9) | 2830 (40.0) | 2992 (33.3)  |
| Treatment (%)           |              |                |         |         |         |              |
| Radiotherapy            | 9744 (30.8)  | 1010 (25.4)    | 1609 (26.7) | 1242 (22.4) | 2477 (35.0) | 3406 (37.9)  |
| Chemotherapy            | 1290 (4.1)   | 192 (4.8)      | 291 (4.8)  | 231 (4.2)  | 223 (3.2)  | 353 (3.9)    |
| Surgery                 | 23446 (74.2) | 2518 (63.4)    | 4146 (68.9) | 3492 (63.0) | 5548 (78.5) | 7742 (86.1)  |

Abbreviations: SD= Standard Deviation
### Table 2: Cox proportional hazards model survival estimates according to deprivation levels of patients diagnosed with endometrial cancer in Germany, 2004–2014 (missing treatment was considered as “not received”).

| N of Events | Q1 | Q2 | Q3 | Q4 | Q5 |
|-------------|----|----|----|----|----|
| **All Stages** | 3446 | | | | |
| Q1 | 1.00 (ref) | 0.91 (0.80-1.04) | 1.00 (ref) | 0.93 (0.82-1.06) | 1.00 (ref) |
| Q2 | 0.99 (0.82-1.20) | 0.93 (0.82-1.06) | 1.00 (ref) | 0.93 (0.82-1.06) | 0.94 (0.82-1.06) |
| Q3 | 1.23 (1.00-1.51) | 1.01 (0.88-1.16) | 1.02 (0.89-1.17) | 1.00 (0.89-1.13) | 1.00 (ref) |
| Q4 | 1.06 (0.89-1.26) | 0.92 (0.81-1.04) | 1.00 (0.89-1.13) | 1.03 (0.91-1.16) | 1.03 (0.91-1.16) |
| Q5 | 1.19 (1.01-1.41) | 1.02 (0.91-1.14) | 1.06 (0.95-1.19) | 1.10 (0.98-1.23) | 1.06 (0.89-1.25) |
| **Stage I** | 1867 | | | | |
| Q1 | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) |
| Q2 | 0.99 (0.82-1.20) | 0.93 (0.82-1.06) | 1.00 (ref) | 0.93 (0.82-1.06) | 0.94 (0.82-1.06) |
| Q3 | 1.23 (1.00-1.51) | 1.01 (0.88-1.16) | 1.02 (0.89-1.17) | 1.00 (0.89-1.13) | 1.00 (ref) |
| Q4 | 1.06 (0.89-1.26) | 0.92 (0.81-1.04) | 1.00 (0.89-1.13) | 1.03 (0.91-1.16) | 1.03 (0.91-1.16) |
| Q5 | 1.19 (1.01-1.41) | 1.02 (0.91-1.14) | 1.06 (0.95-1.19) | 1.10 (0.98-1.23) | 1.06 (0.89-1.25) |
| **Stage II** | 373 | | | | |
| Q1 | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) |
| Q2 | 0.67 (0.44-1.02) | 0.67 (0.44-1.02) | 1.00 (ref) | 0.68 (0.45-1.04) | 0.65 (0.43-1.00) |
| Q3 | 0.90 (0.59-1.35) | 0.93 (0.62-1.41) | 0.93 (0.62-1.42) | 0.97 (0.67-1.39) | 0.87 (0.53-1.42) |
| Q4 | 0.89 (0.62-1.28) | 0.93 (0.65-1.33) | 0.97 (0.67-1.39) | 0.97 (0.69-1.36) | 0.88 (0.52-1.48) |
| Q5 | 0.88 (0.63-1.24) | 0.92 (0.66-1.29) | 0.97 (0.69-1.36) | 0.97 (0.69-1.36) | 0.88 (0.52-1.48) |
| **Stage III** | 750 | | | | |
| Q1 | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) |
| Q2 | 0.92 (0.71-1.18) | 0.94 (0.73-1.21) | 0.92 (0.72-1.19) | 0.91 (0.70-1.18) | 0.91 (0.70-1.18) |
| Q3 | 0.84 (0.63-1.11) | 0.91 (0.69-1.21) | 0.88 (0.66-1.17) | 0.83 (0.61-1.13) | 0.79 (0.55-1.12) |
| Q4 | 0.97 (0.76-1.24) | 1.04 (0.81-1.33) | 1.03 (0.80-1.32) | 0.92 (0.66-1.28) | 0.79 (0.55-1.12) |
| Q5 | 0.90 (0.71-1.14) | 0.94 (0.74-1.19) | 0.95 (0.75-1.21) | 0.79 (0.55-1.12) | 0.79 (0.55-1.12) |
| **Stage IV** | 456 | | | | |
| Q1 | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) | 1.00 (ref) |
| Q2 | 1.00 (0.74-1.35) | 0.96 (0.71-1.30) | 0.96 (0.71-1.31) | 0.96 (0.71-1.31) | 0.98 (0.72-1.34) |
| Q3 | 0.97 (0.70-1.34) | 0.92 (0.66-1.28) | 0.91 (0.66-1.28) | 0.98 (0.68-1.40) | 0.98 (0.68-1.40) |
| Q4 | 0.83 (0.60-1.14) | 0.80 (0.58-1.11) | 0.81 (0.58-1.12) | 0.97 (0.64-1.49) | 0.97 (0.64-1.49) |
| Q5 | 0.90 (0.68-1.20) | 0.88 (0.66-1.17) | 0.91 (0.68-1.22) | 1.02 (0.67-1.57) | 1.02 (0.67-1.57) |

**Model 1**: Adjusted for age and year of diagnosis. **Model 2**: Same as Model 1 plus Grade and Type. **Model 3**: Same as Model 2 plus stage Model 4: Same as Model 3 plus treatment. Stratified analysis: Same as Model 2 plus treatment, Model 5: Same as Model 4 plus registry. Stratified analysis: Same as Model 2 plus treatment and registry.

**Abbreviations**: Q= Quintiles, CI= Confidence Interval.