**Supplementary**

**Supplementary 1:** Detailed information about included covariates

Five covariates from the baseline survey in 2004 were included: school pressure, social support from teachers, social support from classmates, bullying, and parents’ support. School pressure was measured with 2 items developed by Flemming Balvig, scored between 0-2, and 1 item from the Health Behaviour in School-aged Children (HBSC), scored between 0-3, resulting in a sum score of 0-7 (28, 29). The higher the score, the more school pressure. Social support from teachers was measured with 1 item scored 0-3 and developed for the PISA project by the OECD (30). The measure was handled as a dichotomous (score 0-1 = support, score 2-4 = no support). Social support from classmates was measured by 2 items from the HBSC each with a score of 0-3 and the measure was dichotomized (0-4 = no support, 5-8 = support) (29). Bullying was measured with 1 item developed for the VestLiv cohort and the answers were dichotomized (score 0 = not bullied, score 1-3 = bullied). Parents’ support was measured by a shortened version of the Parental Bonding Instrument (PBI) with 4 items regarding each parent with an item score of 0-3. The measure was handled continuous using the average score of the parents’ or, if only one parent, the score of that parent. The higher the score, the more support.

Six register-based covariates were included: sex, country of origin, family history of poor mental health, multimorbidity in family, multimorbidity in the adolescent, and parental cohabitation. Family history of poor mental health was defined as any mental disorder diagnosis since 1995 or any medication use related to mental health the year before the baseline survey, among legal parents or siblings younger than 25 years old living at the same address as the adolescent. Mental disorder diagnoses were obtained since 1995 or since birth, if born after 1995, because of changing in the registration in the register from 1995. Multimorbidity was defined according to a modification of the Nordic Multimorbidity Index (NMI), with exclusion of ICD-10 codes of mental disorder diagnosis (F10 and F17) and medication use related to mental health problems (ATC codes: N05A, N06A, N07BC) (31). The higher the score, the more multimorbidity.

**Supplementary 2:** Detailed information about inverse probability weights (IPW) and multiple imputations (MI)

MI with chained equations and 100 iterations were applied to compensate for missing values of SES measures and covariates in the baseline survey of 2004. The outcome of depressive symptoms was included in the MI of covariates, but MI was not applied to the outcome, since calculating imputations for the outcome based on the same model as the covariates does not add information to the analyses (30, 31). To compensate for unequal probability of participation in the VestLiv cohort, IPW was applied to all survey waves. The probability of being sampled in 2004, 2007 and 2010 was calculated according to sex, parents' mental disorder diagnoses, the adolescents' mental disorder diagnoses, parental educational level, and equalized family income, and for survey 2007 and 2010, the sum score of depressive symptoms in the earlier waves. The probability of being sampled in 2017 and 2021 was calculated by sex, parents' mental disorder diagnoses, the adolescents' mental disorder diagnoses, adolescents’ mediation use, own educational level, equalized family income, labour market participation, and the sum score of depressive symptoms the earlier waves.

**Supplementary F1:** Flowchart of participant included in the different analyses



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| **Supplementary T1: Characteristics of samples (without multiple imputations and inverse probability weights)** |
| **Variables** | **Diagnosis sample** | **Medication sample** | **Trajectory sample** | **2004** | **2007** | **2010** | **2017** | **2021** |
| N=3520 | N=3605 | N=3416 | N=3000 | N=2367 | N=1951 | N=1927 | N=1175 |
| **Sex** | Males | 1799 (51%) | 1856 (51%) | 1714 (50%) | 1483 (49%) | 1089 (46%) | 857 (44%) | 824 (43%) | 454 (39%) |
|  | Females | 1721 (49%) | 1749 (49%) | 1702 (50%) | 1517 (51%) | 1278 (54%) | 1094 (56%) | 1103 (57%) | 721 (61%) |
| **Depressive symptoms** | 15 years |  2.20 (2.12-2.28) |  2.21 (2.13-2.29) |  2.22 (2.14-2.30) |  2.22 (2.14-2.30) |  2.22 (2.13-2.32) |  2.21 (2.11-2.31) |  2.23 (2.13-2.34) |  2.31 (2.17-2.45) |
| N (missing) | 2902 (618) | 2954 (651) | 3000 (416) | 3000 (0) | 2127 (240) | 1772 (179) | 1698 (229) | 1073 (102) |
|  | 18 years |  2.86 (2.76-2.95) |  2.85 (2.76-2.94) |  2.86 (2.85-2.86) |  2.86 (2.76-2.96) |  2.86 (2.76-2.95) |  2.84 (2.73-2.96) |  2.87 (2.76-2.99) |  2.99 (2.84-3.14) |
|  | N (missing) | 2294 (1226) | 2336 (1269) | 2367 (1049) | 2127 (873) | 2367 (0) | 1648 (303) | 1461 (466) | 955 (220) |
|  | 21 years |  2.45 (2.34-2.55) |  2.45 (2.35-2.56) |  2.47 (2.37-2.57) |  2.43 (2.33-2.54) |  2.39 (2.28-2.50) |  2.47 (2.37-2.57) |  2.43 (2.31-2.55) |  2.45 (2.30-2.61) |
| N (missing) | 1885 (1635) | 1924 (1681) | 1951 (1465) | 1772 (1228) | 1648 (719) | 1951 (0) | 1302 (625) | 882 (293) |
|  | 28 years |  2.54 (2.44-2.63) |  2.55 (2.45-2.64) |  2.55 (2.46-2.65) |  2.47 (2.38-2.56) |  2.49 (2.38-2.59) |  2.47 (2.36-2.58) |  2.55 (2.46-2.65) |  2.49 (2.37-2.61) |
|  | N (missing) | 1866 (1654) | 1895 (1710) | 1927 (1489) | 1698 (1302) | 1461 (906) | 1302 (649) | 1927 (0) | 946 (229) |
|  | 32 years |  2.52 (2.40-2.64) |  2.53 (2.41-2.64) |  2.54 (2.42-2.65) |  2.54 (2.42-2.66) |  2.50 (2.38-2.63) |  2.53 (2.40-2.67) |  2.45 (2.33-2.58) |  2.54 (2.42-2.65) |
| N (missing) | 2294 (1226) | 2336 (1269) | 2367 (1049) | 1073 (1927) | 955 (1412) | 882 (1069) | 946 (981) | 1175 (0) |
| **Medication use** | Child (age 4-12) | 23 (1%) | 0 (0%) | 41 (1%) | 30 (1%) | 21 (1%) | 17 (1%) | 15 (1%) | 13 (1%) |
| Adolescence (age 12-17) | 79 (2%) | 74 (2%) | 113 (3%) | 95 (3%) | 76 (3%) | 57 (2%) | 48 (2%) | 51 (3%) |
|  | Adult (age 17-32) | 942 (27%) | 983 (27%) | 985 (29%) | 907 (27%) | 767 (26%) | 570 (24%) | 454 (23%) | 483 (25%) |
|  | Study period (age 0-32) | 1038 (29%) | 1058 (29%) | 1084 (32%) | 1002 (29%) | 847 (28%) | 635 (27%) | 510 (26%) | 535 (28%) |
| **Mental disorder diagnosis** | Child (age 4-12) | 0 (0%) | 80 (2%) | 126 (4%) | 87 (3%) | 62 (2%) | 52 (2%) | 43 (2%) | 37 (2%) |
| Adolescence (age 12-17) | 117 (3%) | 155 (4%) | 172 (5%) | 147 (4%) | 120 (4%) | 84 (4%) | 71 (4%) | 67 (3%) |
| Adult (age 17-32) | 576 (16%) | 605 (17%) | 611 (18%) | 554 (16%) | 457 (15%) | 345 (15%) | 285 (15%) | 313 (16%) |
|  | Study period (age 0-32) | 602 (17%) | 707 (20%) | 743 (22%) | 659 (19%) | 539 (18%) | 406 (17%) | 338 (17%) | 347 (18%) |
| **SSS in school** | High | 1246 (35%) | 1268 (35%) | 1287 (38%) | 1287 (43%) | 920 (39%) | 777 (40%) | 732 (38%) | 487 (41%) |
| Middle | 1445 (41%) | 1470 (41%) | 1493 (44%) | 1493 (50%) | 1072 (45%) | 886 (45%) | 861 (45%) | 508 (43%) |
|  | Low | 116 (3%) | 121 (3%) | 123 (4%) | 123 (4%) | 76 (3%) | 67 (3%) | 65 (3%) | 47 (4%) |
|  | Missing | 713 (20%) | 746 (21%) | 513 (15%) | 97 (3%) | 299 (13%) | 221 (11%) | 269 (14%) | 133 (11%) |
| **SSS in society** | High | 946 (27%) | 959 (27%) | 968 (33%) | 968 (33%) | 685 (33%) | 567 (33%) | 511 (31%) | 335 (32%) |
| Middle | 1838 (52%) | 1871 (52%) | 1907 (65%) | 1907 (65%) | 1363 (66%) | 1145 (66%) | 1124 (68%) | 700 (66%) |
|  | Low | 44 (1%) | 47 (1%) | 47 (2%) | 47 (2%) | 32 (2%) | 27 (2%) | 27 (2%) | 19 (2%) |
|  | Missing | 692 (20%) | 728 (20%) | 133 (11%) | 133 (11%) | 133 (11%) | 133 (11%) | 133 (11%) | 133 (11%) |
| **Household income** | High | 714 (20%) | 721 (20%) | 701 (21%) | 645 (22%) | 527 (22%) | 417 (21%) | 413 (21%) | 270 (23%) |
| Middle | 2124 (60%) | 2172 (60%) | 2077 (61%) | 1847 (62%) | 1470 (62%) | 1238 (63%) | 1195 (62%) | 722 (61%) |
|  | Low | 682 (19%) | 712 (20%) | 638 (19%) | 508 (17%) | 370 (16%) | 296 (15%) | 319 (17%) | 183 (16%) |
| **Educational level** | High | 205 (6%) | 211 (6%) | 207 (6%) | 192 (6%) | 163 (7%) | 147 (8%) | 134 (7%) | 92 (8%) |
| Middle | 2712 (77%) | 2768 (77%) | 2663 (78%) | 2374 (79%) | 1922 (81%) | 1579 (81%) | 1514 (79%) | 947 (81%) |
|  | Low | 515 (15%) | 536 (15%) | 470 (14%) | 370 (12%) | 274 (12%) | 222 (11%) | 240 (12%) | 123 (10%) |
|  | Missing | 88 (3%) | 90 (2%) | 76 (2%) | 64 (2%) | 8 (0%) | 3 (0%) | 39 (2%) | 13 (1%) |
| **Origin** | Denmark | 3304 (94%) | 3385 (94%) | 3238 (95%) | 2864 (95%) | 2270 (96%) | 1890 (97%) | 1860 (97%) | 1142 (97%) |
|  | Other | 216 (6%) | 220 (6%) | 178 (5%) | 136 (5%) | 97 (4%) | 61 (3%) | 67 (3%) | 33 (3%) |
| **Cohabitation** | No | 1113 (32%) | 1162 (32%) | 1056 (31%) | 874 (29%) | 601 (25%) | 498 (26%) | 554 (29%) | 319 (27%) |
|  | Yes | 2407 (68%) | 2443 (68%) | 2360 (69%) | 2126 (71%) | 1766 (75%) | 1453 (74%) | 1373 (71%) | 856 (73%) |
| **Bullied** | No | 2158 (61%) | 2196 (61%) | 2222 (65%) | 2222 (74%) | 1574 (66%) | 1313 (67%) | 1262 (65%) | 794 (68%) |
|  | Yes | 717 (20%) | 730 (20%) | 750 (22%) | 750 (25%) | 537 (23%) | 442 (23%) | 423 (22%) | 270 (23%) |
|  | Missing | 645 (18%) | 679 (19%) | 444 (13%) | 28 (1%) | 256 (11%) | 196 (10%) | 242 (13%) | 111 (9%) |
| **Support classmates** | No | 171 (5%) | 178 (5%) | 181 (5%) | 181 (6%) | 119 (5%) | 117 (6%) | 105 (5%) | 74 (6%) |
| Yes | 2688 (76%) | 2731 (76%) | 2774 (81%) | 2774 (92%) | 1986 (84%) | 1635 (84%) | 1573 (82%) | 988 (84%) |
|  | Missing | 661 (19%) | 696 (19%) | 461 (13%) | 45 (2%) | 262 (11%) | 199 (10%) | 249 (13%) | 113 (10%) |
| **Support teacher** | No | 453 (13%) | 460 (13%) | 467 (14%) | 467 (16%) | 295 (12%) | 248 (13%) | 244 (13%) | 166 (14%) |
| Yes | 2421 (69%) | 2464 (68%) | 2503 (73%) | 2503 (83%) | 1815 (77%) | 1508 (77%) | 1442 (75%) | 896 (76%) |
|  | Missing | 646 (18%) | 681 (19%) | 446 (13%) | 30 (1%) | 257 (11%) | 195 (10%) | 241 (13%) | 113 (10%) |
| **NMI** | Mean (95%CI) | 0.14 (0.13-0.16) | 0.14 (0.13-0.16) | 0.15 (0.13-0.17) | 0.17 (0.15-0.19) | 0.15 (0.13-0.17) | 0.14 (0.12-0.16) | 0.15 (0.13-0.17) | 0.16 (0.13-0.19) |
|  | N (missing) | 3520 (0) | 3605 (0) | 3416 (0) | 3000 (0) | 2367 (0) | 1951 (0) | 1927 (0) | 1175 (0) |
| **Parents' support** | Mean (95%CI) | 9.31 (9.23-9.39) | 9.30 (9.23-9.38) | 9.30 (9.22-9.37) | 9.30 (9.22-9.37) | 9.38 (9.29-9.47) | 9.31 (9.21-9.41) | 9.27 (9.17-9.37) | 9.22 (9.09-9.35) |
| N (missing) | 2865 (655) | 2916 (689) | 2960 (456) | 2960 (40) | 2104 (263) | 1748 (203) | 1676 (251) | 1058 (117) |
| **School pressure** | Mean (95%CI) | 3.04 (2.99-3.08) |  3.04 (2.99-3.09) |  3.04 (2.99-3.08) |  3.04 (2.99-3.08) |  3.00 (2.95-3.06) |  2.98 (2.92-3.04) |  3.02 (2.96-3.08) |  2.94 (2.87-3.02) |
| N (missing) | 2829 (691) | 2873 (732) | 2917 (499) | 2917 (83) | 2078 (289) | 1732 (219) | 1663 (264) | 1052 (123) |

\*SSS = Subjective Social Status

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| Supplementary T2: Cumulative incidence of mental disorder diagnosis at age 32 |
| Variables | Cumulative incidence (95% Confidence interval) |
| Total |  | 0.19 (0.17-0.20) |
| Household income | High | 0.13 (0.11-0.16) |
|  | Medium | 0.17 (0.16-0.19) |
|  | Low | 0.27 (0.24-0.31) |
| Educational level | High | 0.17 (0.12-0.22) |
|  | Medium | 0.17 (0.16-0.19) |
|  | Low | 0.26 (0.22-0.30) |
| SSS school | High | 0.15 (0.13-0.17) |
|  | Medium | 0.20 (0.18-0.22) |
|  | Low | 0.32 (0.24-0.40) |
| SSS society | High | 0.16 (0.13-0.18) |
|  | Medium | 0.20 (0.18-0.21) |
|  | Low | 0.34 (0.21-0.47) |

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| Supplementary T3: Fit indices for different trajectory models |
| Polynomic function | **Groups <5%** | **BIC** | **APPA** | **OCC** |
| G1 | G2 | G3 | G4 | G1 | G2 | G3 | G4 |
| 1323 | 0 | -18739.0 | .7443463 | .654865 | .7605767 | .7770233  | 3.556109  | 2.678051 | 55.73622 | 39.42347 |
| 2323 | 0 | -18742.98 | .7499905  | .6506791 | .7686384 | .7794708 | 3.473496 | 2.760712 | 59.02599 | 40.41907 |
| 3323 | 0 | -18744.44 | .7736531  | .6411836 | .7681257 | .7710739 | 3.228473 | 3.198267 | 59.8737 | 41.62137 |
| 2332 | 0 | -18746.12 | .7677459 | .6619402 | .6538717 | .6792948 | 2.796953 | 3.811602 | 34.83157 | 29.25854  |
| 1223 | 0 | -18746.94 | .7785233 | .6603172 | .5923931 | .6182912 | 2.74738 | 4.078065 | 26.11354  | 24.01945 |
| 3332 | 0 | -18746.99 | .7154176 | .6691424 | .7598745 | .768221 | 3.823975 | 2.412246 | 53.78057 | 32.81883 |
| 3223 | 0 | -18747.81 | .7584587 | .635237 | .7718942 | .7760625 | 3.112618 | 3.053902 | 59.51336 | 39.4025 |
| 2223 | 0 | -18750.94 | .7252828  | .6595263  | .7589666 | .7643776 | 3.602355  | 2.535337 | 54.14765  | 33.20676  |

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| **Supplementary Table 4:** Characteristics of trajectory groups |
|  |  | **Trajectory groups** |
| **Variables** |  | **Low stable** | **Moderate stable** | **Decreasing**  | **Increasing** |
|  | N=1580 | N=1484 | N=143 | N=209 |
| **Sex**(N (%)) | Males | 911 (58%) | 680 (46%) | 43 (30%) | 80 (38%) |
| Females | 669 (42%) | 804 (54%) | 100 (70%) | 129 (62%) |
| **Depressive symptoms**(Mean (95% CI)) | 15 years |  1.00 (0.94-1.06) | 2.64 (2.55-2.73) | 8.31 (8.04-8.59) | 3.85 (3.51-4.19) |
| N (missing) | 1378 (202) | 1322 (162) | 143 (0) | 157 (52) |
| 18 years |  1.35 (1.28-1.42) | 3.77 (3.65-3.88) | 4.34 (3.85-4.84) | 6.69 (6.30-7.07) |
| N (missing) | 1098 (482) | 1023 (461) | 96 (47) | 150 (59) |
| 21 years | 1.09 (1.02-1.16) | 3.19 (3.06-3.32) | 2.98 (2.45-3.50) | 7.33 (6.97-7.68) |
| N (missing) | 924 (656) | 812 (672) | 80 (63) | 135 (74) |
| 28 years | 1.45 (1.36-1.53) | 3.13 (3.02-3.25) | 2.76 (2.41-3.12) | 6.55 (6.18-6.93) |
| N (missing) | 885 (695) | 839 (645) | 84 (59) | 119 (90) |
| 32 years | 1.48 (1.36-1.59) | 3.02 (2.87-3.18) | 3.08 (2.63-3.53) | 6.08 (5.55-6.61) |
| N (missing) | 522 (1058) | 514 (970) | 63 (80) | 76 (133) |
| **Medication use**(N (%)) | Child (age 4-12) | 11 (1%) | 18 (1%) | 0 (0%) | 0 (0%) |
| Adolescence (age 12-17) | 38 (2%) | 38 (3%) | 10 (7%) | 9 (4%) |
| Adult (age 17-32) | 299 (19%) | 420 (28%) | 65 (45%) | 123 (59%) |
| Study period (age 0-32) | 345 (22%) | 464 (31%) | 67 (47%) | 126 (60%) |
| **Mental disorder diagnoses**(N (%)) | Child (age 6-12) | 41 (3%) | 30 (2%) | 5 (3%) | 11 (5%) |
| Adolescence (age 12-17) | 50 (3%) | 74 (5%) | 9 (6%) | 14 (7%) |
| Adult (age 17-32) | 177 (11%) | 241 (16%) | 46 (32%) | 90 (43%) |
| Study period -(age 6-32) | 230 (15%) | 291 (20%) | 52 (36%) | 86 (41%) |
| **SSS in school**(N (%)) | High | 749 (47%) | 581 (39%) | 48 (34%) | 51 (25%) |
| Middle | 802 (51%) | 837 (56%) | 64 (45%) | 135 (65%) |
| Low | 29 (2%) | 66 (4%) | 31 (22%) | 23 (11%) |
| **SSS in society**(N (%)) | High | 553 (35%) | 420 (28%) | 38 (27%) | 44 (21%) |
| Middle | 1003 (64%) | 1044 (70%) | 98 (69%) | 158 (75%) |
| Low | 24 (2%) | 20 (1%) | 6 (4%) | 8 (4%) |
| **Income**(N (%)) | High | 272 (17%) | 275 (19%) | 26 (18%) | 65 (31%) |
| Middle | 960 (61%) | 912 (61%) | 94 (66%) | 111 (53%) |
| Low | 348 (22%) | 297 (20%) | 23 (16%) | 33 (16%) |
| **Educational level**(N (%)) | High | 209 (13%) | 218 (15%) | 25 (18%) | 51 (24%) |
| Middle | 1286 (81%) | 1162 (78%) | 112 (78%) | 144 (69%) |
| Low | 85 (5%) | 104 (7%) | 6 (4%) | 14 (7%) |
| **Origin**(N (%)) | Denmark | 1501 (95%) | 1409 (95%) | 133 (93%) | 195 (93%) |
| Other | 79 (5%) | 75 (5%) | 10 (7%) | 14 (7%) |
| **Cohabitation**(N (%)) | No | 410 (26%) | 507 (34%) | 57 (40%) | 82 (39%) |
| Yes | 1170 (74%) | 977 (66%) | 86 (60%) | 127 (61%) |
| **Bullied**(N (%)) | No | 1291 (82%) | 1058 (71%) | 73 (51%) | 125 (60%) |
| Yes | 289 (18%) | 426 (29%) | 70 (49%) | 84 (40%) |
| **Support classmates**(N (%)) | No | 1523 (96%) | 1396 (94%) | 96 (67%) | 189 (90%) |
| Yes | 57 (4%) | 88 (6%) | 47 (33%) | 20 (10%) |
| **Support teacher** (N (%)) | No | 187 (12%) | 264 (18%) | 46 (32%) | 46 (22%) |
| Yes | 1393 (88%) | 1220 (82%) | 97 (68%) | 163 (78%) |
| **NMI**(Mean (95% CI)) | Mean (95%CI) | 0.14 (0.11-0.16) | 0.16 (0.13-0.19) | 0.17 (0.08-0.27) | 0.16 (0.08-0.24) |
| N (missing) | 1580 (0) | 1484 (0) | 143 (0) | 209 (0) |
| **Parents' support**(Mean (95% CI)) | Mean (95%CI) | 9.74 (9.65-9.84) | 9.09 (8.98-9.20) | 7.48 (7.04-7.92) | 8.27 (7.89-8.66) |
| N (missing) | 1580 (0) | 1484 (0) | 143 (0) | 209 (0) |
| **School pressure**(Mean (95% CI)) | Mean (95%CI) | 2.89 (2.82-2.95) | 3.14 (3.08-3.21) | 3.38 (3.12-3.65) | 3.34 (3.12-3.56) |
| N (missing) | 1580 (0) | 1484 (0) | 143 (0) | 209 (0) |