

led to hospitalization of 119 patients (68%). Pulmonary involvement was recorded for 81% of cases (142/176) and two organs or more were involved in 35% (61/176). An increase in severity was observed mainly in recent years [1988–1997: 1/32 (3%); 1998–2007: 9/54 (17%); 2008–2016: 19/89 (21%); $P = 0.05$]. The overall mortality was 17.6% (31/176); 6% (2/33) in 1988–1997, 20% ($n = 11/54$) in 1998–2007 and 20% in 2008–2016 ($n = 18/89$) ($P = 0.15$). There was also a significant increase in age at diagnosis ($P = 0.005$), the proportion of diabetic patients ($P = 0.03$) and the proportion of immunocompromised patients ($P = 0.009$) over time. The independent risk factors of mortality were age (aOR 1.03 for each additional year, 95% CI 1.0–1.06, $P = 0.05$) and immunosuppression (aOR 3.62, 95% CI 1.54–8.49, $P = 0.003$).

Conclusion. The severity of blastomycosis observed in Quebec over the past 30 years has increased. These changes could be explained in part by an increase in the number of immunosuppressed patients. However, mortality has remained stable in recent years.

Disclosures. All authors: No reported disclosures.

362. Species Distribution and Trends of Invasive Candidiasis in the United States, 2009–2015, Using a Large Electronic Medical Record Database

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Session: 56. Fungal Disease: Management and Outcomes
Thursday, October 4, 2018: 12:30 PM

Background. While 50% of invasive candidiasis (IC) has historically been caused by *C. albicans*, the changing epidemiology and rise in drug-resistant *Candida* necessitates understanding the contribution of specific *Candida* species to IC. To date, species and site-specific trends in IC have not been reported on a large scale using US clinical data.

Methods. Using the Cerner Health Facts electronic health record (EHR) dataset, inpatient hospitalizations with any *Candida* spp. isolated from blood or a sterile site (SS) (abdominal or other) were identified from 2009 to 2015. Patient characteristics were described by species. Significant relationships ($P \leq 0.05$) were assessed using chi-squared or exact binomial tests. Annual percent change in IC incidence by site and species were assessed via Poisson regression.

Results. Overall, 19,310 *Candida* isolates from 10,313 patients were identified. Of these, 46% of isolates were *C. albicans*, 22% *C. glabrata*, 14% *C. parapsilosis*, 7% *C. tropicalis*, and 11% other/unspecified; no *C. auris* infections were identified. The overall incidence of IC was 99 cases/100,000 patients. Compared with *C. albicans*, isolation of other species was 35% more frequent from blood, and 43% and 30% less frequent from non-blood abdominal and non-abdominal SSs, respectively (Table 1). Total IC increased by 1% (95% CI = 0.2–2%) annually; while abdominal and SS IC significantly increased by 6% (4–8%) and 11% (9–13%) per year, respectively, candidemia decreased significantly by 4.5% (3–6%) annually. Among *C. albicans* infections candidemia decreased by 6.5% (5–8%) annually, while abdominal (5%, 3–8%) and other SS infections (10%, 7–13%) increased (Figure 1). Candidemia incidence remained unchanged for the other species. SS infections increased for every species, and abdominal infections increased for all but *C. parapsilosis* (Figure 2).

Conclusion. In this first large-scale study on trends in IC using US hospital EHR data, the species distribution of IC isolates varied between blood and non-blood SSs. The incidence of candidemia is decreasing, but not for potentially drug-resistant species such as *C. glabrata*, which continue to pose treatment challenges.

This work was supported in part by the Division of Intramural Research, NIAID, NIH

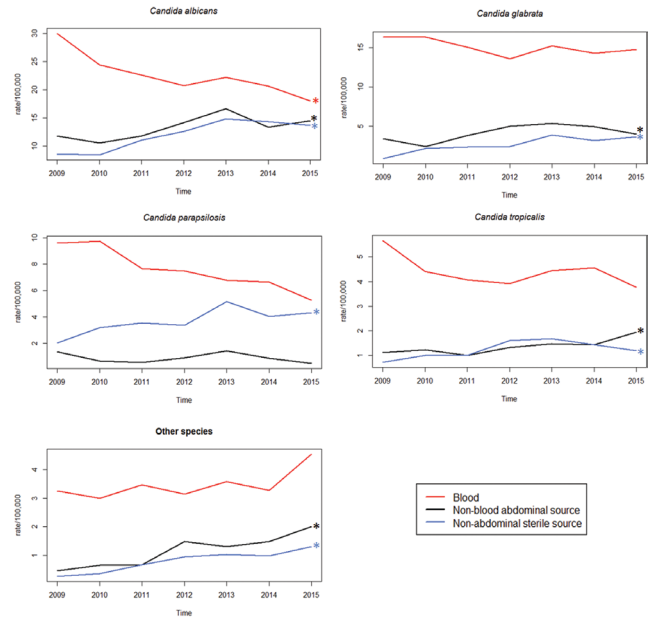


Figure 1. Source-specific incidence trends by species. Significance determined by Poisson regression denoted by *.

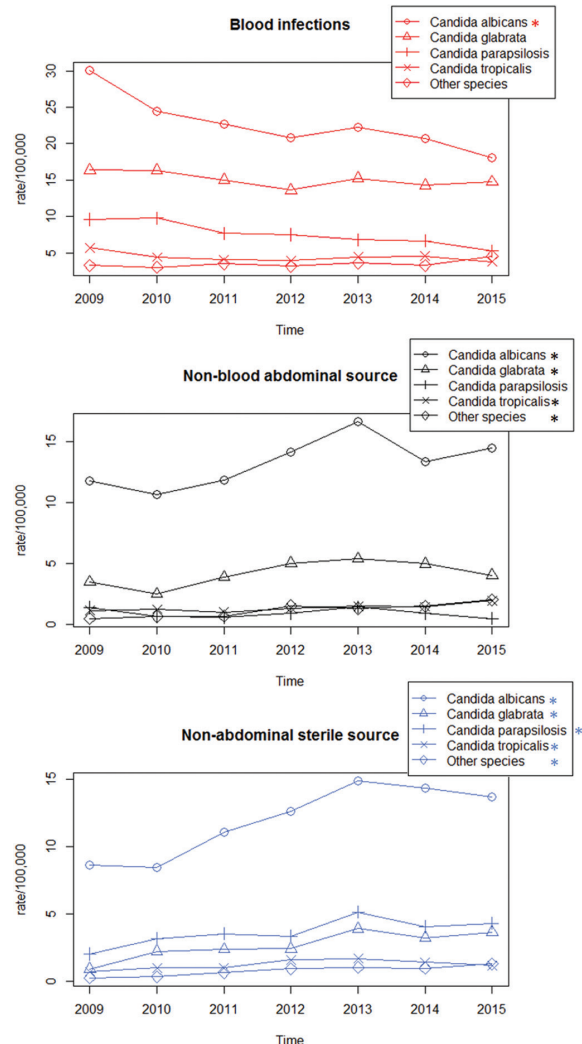


Figure 2. Species-specific incidence trends by infection source. Significance determined by Poisson regression denoted by *.

| Table 1. Patient demographics by species | | | | | |
|--|--|--|--|---|--------------------------|
| | <i>C. albicans</i> N (col %) = 5447 | <i>C. glabrata</i> N (col %) = 2492 | <i>C. parapsilosis</i> N (col %) = 1369 | <i>C. tropicalis</i> N (col %) = 778 | Other N (col %) = 608 |
| Gender | | | | | |
| Female [N (%)] = 5008 (48) | 2639 (48) | 1322 (53)* | 598 (44)* | 358 (46) | 279 (46) |
| Male [5336 (52)] | 2807 (52) | 1170 (47)* | 770 (56)* | 420 (54) | 329 (54) |
| Age | | | | | |
| <1 year [N (%)] = 173 (2)] | 86 (2) | 11 (0) | 57 (4) | 10 (1) | 13 (2) |
| 1–17 years [274 (3)] | 134 (2) | 16 (1) | 62 (5) | 35 (4) | 48 (8) |
| 18–39 years [1155 (11)] | 657 (12) | 210 (8) | 155 (11) | 102 (13) | 121 (20) |
| 40–64 years [4368 (42)] | 2340 (43) | 1029 (41) | 604 (44) | 335 (43) | 245 (40) |
| 65+ years [4343 (42)] | 2230 (41) | 1226 (49) | 491 (36) | 296 (38) | 181 (30) |
| Neonate (<4 weeks) [N (%)] = 106 (1)] | 59 (1.1) | <5 (NR) | 34 (2.5)* | <5 (NR) | <5 (NR) |
| Race | | | | | |
| African American [N (%)] = 2127 (21)] | 947 (17)* | 555 (22) | 379 (28)* | 189 (24)* | 121 (20) |
| Caucasian [7173 (70)] | 3965 (73)* | 1710 (69) | 837 (61)* | 512 (66)* | 424 (70) |
| Other [820 (8)] | 426 (8) | 191 (8) | 119 (9) | 65 (8) | 47 (8) |
| Unknown [193 (2)] | 109 (2) | 36 (1) | 34 (2) | 12 (2) | 16 (3) |
| Census region | | | | | |
| Midwest [N (%)] = 1818 (18)] | 1106 (20)* | 461 (18) | 173 (13)* | 112 (14)* | 104 (17) |
| Northeast [3239 (31)] | 1713 (31) | 778 (31) | 469 (34)* | 205 (26)* | 167 (27)* |
| South [4123 (40)] | 1937 (36)* | 980 (39) | 611 (45)* | 406 (52)* | 274 (45)* |
| West [1133 (10)] | 691 (13)* | 273 (11) | 116 (8)* | 55 (7)* | 63 (10) |
| Patient encounters (with ≥1 culture positive) | N (%) = 5668 | N (%) = 2598 | N (%) = 1431 | N (%) = 808 | N (%) = 629 |
| Infection type (encounters) | | | | | |
| †Candidemia [N (%)] = [6011 (55)] | 2650 (47)* | 1776 (68)* | 885 (62)* | 503 (62)* | 401 (64)* |
| ‡Abdominal [2437 (22)] | 1567 (28)* | 499 (19)* | 103 (7)* | 156 (19)* | 132 (21) |
| §Other sterile [2531 (23)] | 1451 (26)* | 323 (12)* | 444 (31)* | 149 (18)* | 96 (15)* |

C. albicans and *C. parapsilosis* had 1 patient each with unknown gender

* $p \leq 0.05$ compared to total sample population

Other species include: *C. catenulata*, *C. ciferrii*, *C. dubliniensis*, *C. famata*, *C. guilliermondii*, *C. haemulonii* (non-susceptible), *C. kefyr*, *C. lambica*, *C. lipolytica*, *C. lusitanae*, *C. magnoliae*, *C. norvegensis*, *C. pelliculosa*, *C. pulcherrima*, *C. rugosa*, *C. spharctica*, *C. stellatoidea*, *C. utilis*, *C. zeylanoides*

<5 (NR) = Number of cases <5, exact count and percentage not reported to preserve data anonymity

†Candidemia with or without disseminated infection; ‡Abdominal sterile source without candidemia; §Non-abdominal sterile source without candidemia

Disclosures. All authors: No reported disclosures.