Oregon EIP Candidemia surveillance

Data from January 2020 to December 2023

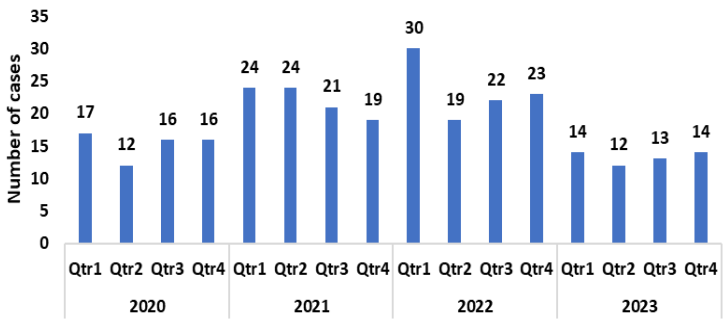
April 2024

The Oregon Emerging Infection Program (EIP) conducts laboratory and population-based surveillance for *Candida* spp. bloodstream infection among residents of the tri-county (Clackamas, Multnomah, and Washington) Portland metropolitan area (2022 estimated population: 1,828,564). Oregon is one of ten EIP sites participating in this surveillance project. The main objectives are:

- To determine how many *Candida* bloodstream infections occurred in the surveillance area.
- To describe people at risk for *Candida* bloodstream infections
- To identify which types of *Candida* cause illness
- To reveal trends of drug resistance
- For more information about the EIP Candidemia surveillance project, see http://www.cdc.gov/hai/eip/*Candida*.html

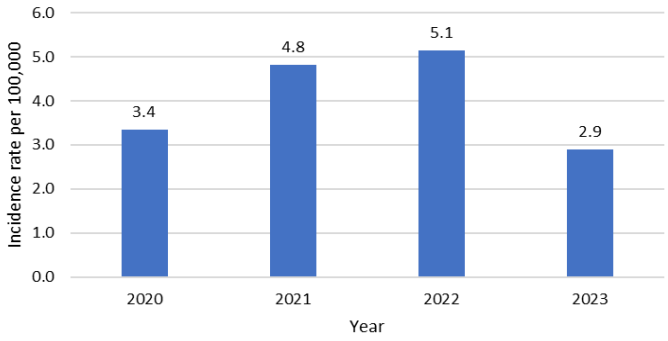
In 2023, there were 53 cases of candidemia. The total number of cases from 2020 to the end of 2023 amounted to 296. Figure 1 illustrates that the number of cases detected in 2023 (53 cases) were less than those detected in the previous three years (61, 88, and 94, respectively). Notably, during each year of surveillance, quarter one consistently exhibited the highest number of cases.

Fig 1. Candidemia cases in Tri-county area, Oregon, by date of incident specimen collection, Jan 2020-Dec 2023



The incidence of candidemia cases (per 100,000 population) in the four years of surveillance were 3.4, 4.8, 5.1 and 2.9 cases respectively (Fig 2), indicating a considerable reduction in incidence in year 2023 compared to the previous three years of the surveillance.

Fig 2. Candidemia incidence rate per 100,000 in Tri-county area from 2020-2023



Candidemia cases mean age was 57 ± 19 years, males were 56% of cases. Candidemia affect mainly older age group. About 69% of cases occurred above 50 years of age and the maximum occurrence were among 50-69 years old group (30 %) Table 1. Majority of cases were white (224 cases, 76%) and of non-Hispanic or Latino ethnicity (241 cases, 81%). Mortality outcomes were high, 103 cases (35%) died before hospital discharge and 131 (44%) died within three months after date of incident specimen collection (DISC). Most mortality occurred for cases above 50 years (105 cases, 80%) Table 1.

Table 1. Distrbution of Candidemia cases by age group, sex and mortality numbers and percentages. Tricounty area, 2020-2023

Age group	Female		Male		Death		Grand Total
	n	%	n	%	n	%	
<5	3	2%	5	3%	0	0	8 (3)
"5-17"	1	1%	1	1%	0	0	2(1)
"18-34"	13	10%	19	11%	6	5%	32(11)
"35-49"	18	14%	32	19%	20	15%	50(17)
"50-64"	41	32%	47	28%	43	33%	88(30)
"65-79"	40	31%	47	28%	50	38%	87(29)
>80	13	10%	16	10%	12	9%	29(10)
Grand Total	129		167		131		296

These findings highlight the severity of candidemia and underscore the importance of early detection and effective management.

- 53% had a central venous catheter in the previous 2 days to the date of incident specimen collection (DISC).
- 74% had received systemic antibiotic in the 2 weeks before DISC.
- 35% had surgery 90 days before DISC.
- 34% had History of IDU in previous year before the DISC.
- 17% received TPN in the 14 days before DISC.
- 6% had been neutropenic in the previous 2 days to DISC.
- Other underlying medical conditions reported were, diabetes (31%), liver diseases such as cirrhosis and hepatitis (22%), recent history of cancer (30%), and dialysis (6%). About one third (33%) had received systemic steroids in the month prior to DISC.

Table 2. Underlying conditions in the past 90 days prior to date of intial specimen collected associated with candidemia cases, January 2020-December 2023, Portland Tri-county area (n=296)

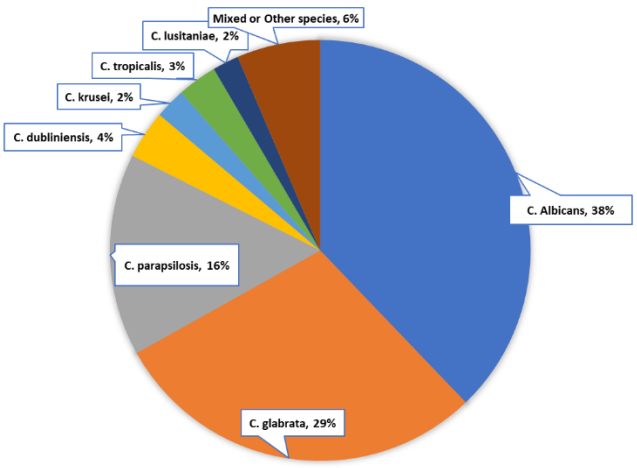
	2020	2021	2022	2023	Total	%
Underlying conditions	n=61	n=88	n=94	N=53	n=296	
None	6	3	5	4	18	6%
Chronic Lung Disease	15	22	30	12	79	27%
Diabetes Mellitus	15	30	28	19	92	31%
Cardiovascular Disease	11	43	52	26	132	45%
Gastrointestinal Disease	8	16	21	9	54	18%
Immunocompromised Condition	0	4	1	1	6	2%
Liver Disease	7	27	21	11	66	22%
Malignancy	18	31	28	13	90	30%
Neurologic Condition	9	25	28	13	75	25%
Renal Disease	11	36	35	19	101	34%
Skin Condition	1	17	20	8	46	16%
Other	9	19	17	12	57	19%
Chronic Dialysis	1	3	10	3	17	6%
Surgeries in the 90 days before not including DISC						
Abdominal surgery	9	26	19	7	61	21%
Non-abdominal surgery	6	19	12	9	46	16%
No surgery	45	45	63	38	191	65%
Pancreatitis	3	8	4	1	16	5%
Chronic Urinary Tract Problems/Abnormalities	16	41	44	24	125	42%
in the 2 calendar days before, not including the DISC						
Patient neutropenic	1	7	5	6	19	6%
Have a CVC in the 14 days before, not including the DISC	28	49	50	30	157	53%
Systemic antibacterial medication	37	70	71	40	218	74%
Have total parenteral nutrition (TPN)	14	12	16	8	50	17%
in the 30 days before, not including the DISC						
Systemic steroids	3	30	42	22	97	33%
IV drug use	16	30	30	25	101	34%

Figure 3 demonstrates the frequency of *Candida* isolates cultured from the blood. Like previous years the most three dominate species detected from 296 cases were:

- *C. albicans*, (n=112, 38%).
- *C. glabrata* (n=86, 27%)
- *C. parapsilosis* (n=46, 17%).

Among all the cultured isolates, the three species mentioned earlier accounted for 82% of all isolates from patients residing in the Tri-county area in Oregon. The remaining species had a frequency of isolation of less than 4% each.

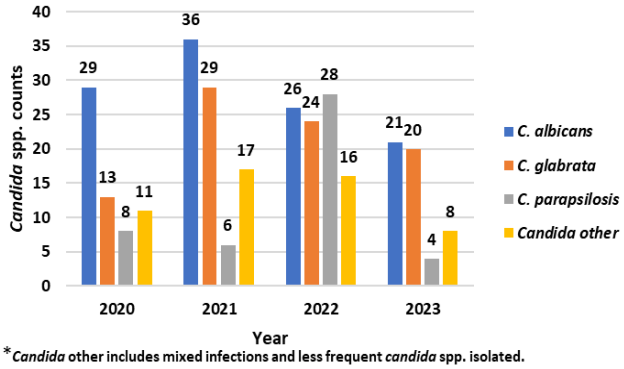
FIG 3. CANDIDA BLOOD ISOLATES BY SPECIES, PORTLAND TRI-COUNTY AREA, JAN 2020-DEC 2023



These findings provide valuable insights into the prevalence of different *Candida* species in candidemia cases.

The predominance of the three isolates mentioned above were seen through the years of surveillance, however minor changes in the ranks of predominance occurred; in year 2022 *C. parapsilosis* was the most predominant species isolated followed by *C. albicans*. In year 2023 there was marked reduction in the isolation of *C. parapsilosis* from 28 isolate in year 2022 to only 4 isolates in year 2023.

Fig 4. Frequency of *Candida* species* by year. Tri-county area, Oregon Jan 2020-Dec 2023



**Candida* other includes mixed infections and less frequent *candida* spp. isolated.*

Conclusion: The annual reports from the current surveillance consistently highlight fluctuations in the number of candidemia cases and the individual *Candida* species isolated. Among these species, *C. albicans, C. glabrata, and C. parapsilosis* consistently dominate. Additionally, the persistently high mortality rate exceeding 40% has been well-documented.