

AIM

The clinical laboratory sector has significant staffing shortages due to many factors. In HLA labs, the increasing use of virtual crossmatching (VXM) to facilitate organ transplantation may impact job satisfaction of HLA professionals. Anecdotally, the rising volume of VXM requests, particularly after hours, may be contributing to heightened concerns and burnout. This study investigated the frequency and patterns of VXM requests throughout the day to understand the potential impact on HLA experts and help leaders develop better recruitment/retention strategies.

METHODS

We reviewed all VXM requests made for our transplant program over a 15-month period, for 2024 and the first quarter of 2025. VXM is routinely requested for deceased donor kidney and heart transplants, with HLA laboratory directors and supervisor available to render a consultation within 1 hour. To determine the frequency and timing of VXM requests, we analyzed the time-of-day VXMs are performed. Requests for living donors and liver transplants were excluded. VXMs were categorized by shift corresponding to typical laboratory work: 1st (7 AM–3 PM), 2nd (3 PM–11 PM), and 3rd (11 PM–7 AM). We also compared the frequency of requests during regular business hours (8 AM–6 PM) versus on-call/overnight hours (6 PM–8 AM).

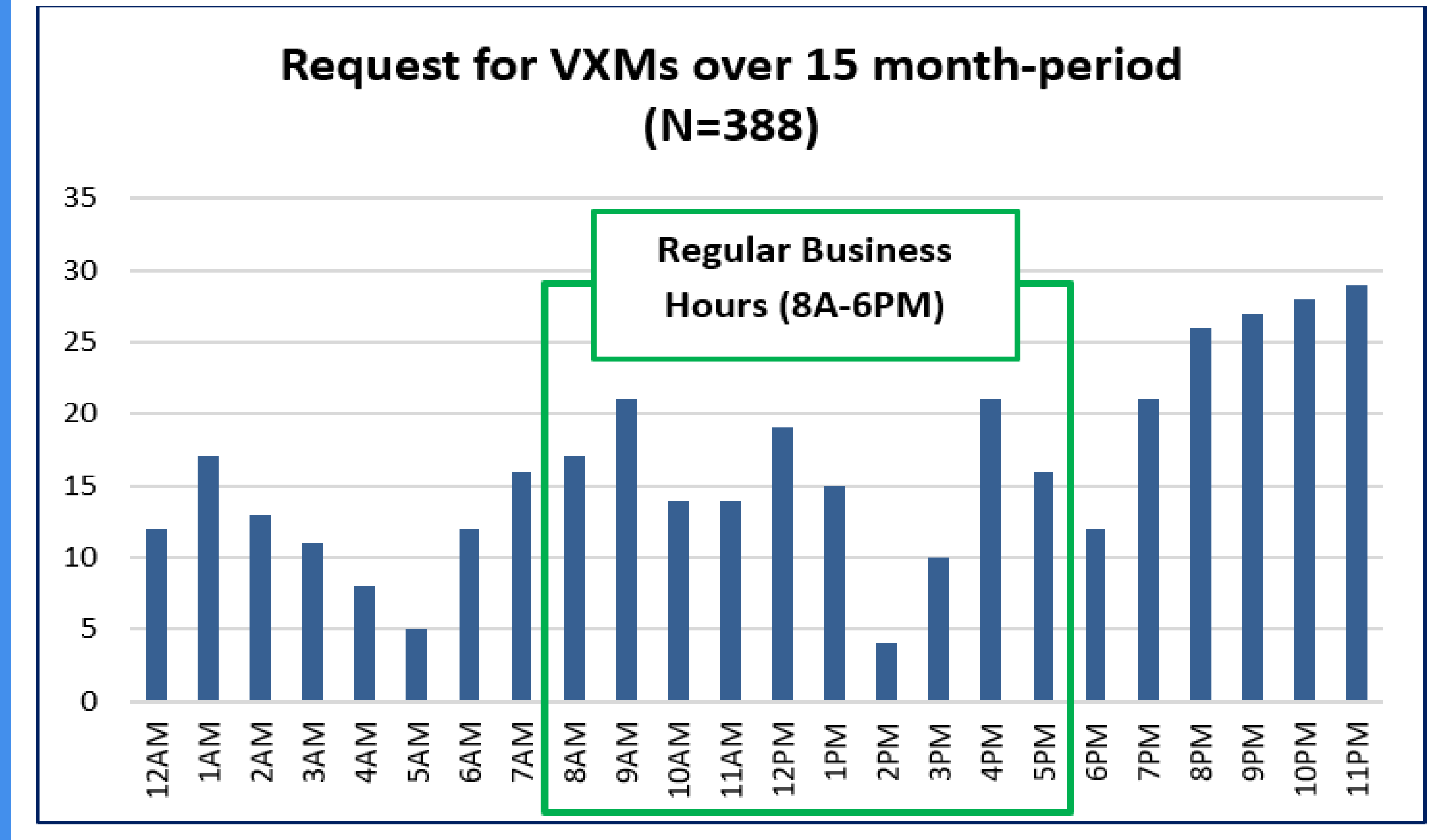


Figure 1: Time-of-day VXM requests and consults rendered over a 15-month period. Y-axis is frequency of calls; X-axis is time of day. Each bar represents one hour block (e.g. the bar with n=10 at 3PM indicates a VXM was requested 10 times during from 3PM-3:59 PM). Green box is generally considered 'normal business hours.' The hours representing 8PM, 9PM, 10PM and 11PM are the individual hours of the day when most VXMs are requested and rendered.

	2024		2025 (Q1)		Combined 15 month	
	n	%	n	%	n	%
Organ						
Kidney	174	56.7	45	54.8	214	56.3
Heart	128	41.7	35	43.8	160	42.1
Hear/Kidney	5	1.6	1	1.4	6	1.6
Time of VXM						
1st shift (7A-3P)	102	33.2	18	20.5	120	30.9
2nd shift (3P-11P)	120	39.1	41	52.1	161	41.5
3rd shift (11P-7A)	85	27.7	22	27.4	107	27.6
Business Hours (8A-6P)	118	38.4	33	52.1	151	38.9
After Hours (6P-8A)	189	61.6	43	58.9	237	61.1
10P-6AM	97	31.6	26	32.1	123	31.6
Total	307	100%	81	100%	380	100%

RESULTS

In our study period, we completed 151 deceased donor transplants. Of these, 124 organ transplants (or 120 individual patients) required a VXM (37 kidney, 87 heart of which 4 patients heart-kidney). Over the same 15 period, we received and rendered 388 VXM consultations with 56.3% (n=214) for kidney while the remaining 42.1% (n=160) were for heart or combined heart/kidney (n=6) offers. Thus, an average of 3.13 VXMs were requested and performed per completed organ transplanted. The vast majority (61%) of VXMs performed outside of regular business hours (6PM-8AM) with a surprising proportion (31.6%) occurring during normal sleep times (10P-6A).

CONCLUSION

At our center, most VXM are requested and performed outside of regular business hours, contrasting with typical workload of clinical consultants in other clinical laboratory areas. In the current healthcare landscape, where staffing retention and compensation are key concerns, it is important to recognize and appropriately compensate or provide additional staffing support for work performed outside of regular business hours as HLA Directors and supervisors are generally exempt employees.

References: Puttarajappa CM et al. Virtual Crossmat for Deceased Donor Kidney Transplantation in the United States: A Survey of Histocompatibility Lab Directors and Transplant Surgeons. Hum Immunol. 2022 Dec 27;84(3):214–223

