Development of a Natural Language Processing Algorithm to Identify Helmet Use Among Injured Bicyclists in Syndromic Surveillance Data

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14. ABSTRACT
This study developed a natural language processing (NLP) algorithm to find mentions of helmet use in hospital triage notes, using a subset of bike injury cases from the UW Medicine electronic medical records (UW EMR).The trained model achieved high performance (accuracy = 0.87, precision = 0.83, recall = 0.94, F1 = 0.88). Applying the model, we observed that helmet use among injured cyclists seen in UW Medicine increased from around 15% to 20% between 2021 and 2024. For RHINO data, we found an increasing trend in the missing triage notes from bike injuries between 2018 and 2023, and further investigation is needed.

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Development of a Natural Language Processing Algorithm to Identify Helmet Use Among Injured Bicyclists in Syndromic Surveillance Data:

A Technical Report for the Washington Traffic Safety Commission

Report

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Contents

Abstract

The repeal of King County's adult bicycle helmet law in March 2022 raised concerns that fewer cyclists might wear helmets, resulting in more head injuries. Data from the Rapid Health Information NetwOrk (RHINO) may be used to track changes in helmet use over time, but helmet use is mentioned only in triage notes, which are difficult to review manually. We developed a natural language processing (NLP) algorithm to find mentions of helmet use in these notes, using a subset of bike injury cases from the UW Medicine electronic medical records (UW EMR). We then applied this algorithm to the full UW EMR dataset and the RHINO dataset. The trained model achieved high performance (accuracy = 0.87, precision = 0.83, recall = 0.94, F1 = 0.88). Applying the model, we observed that helmet use among injured cyclists seen in UW Medicine increased from around 15% to 20% between 2021 and 2024. For RHINO data, we found an increasing trend in the missing triage notes from bike injuries between 2018 and 2023, and further investigation is needed.

Introduction

For many years, King County was the largest county in the US with a law requiring adults to wear helmets while riding bicycles. However, after controversy regarding disproportionate enforcement of the law, King County's adult helmet law was repealed in March 2022 [1]. This repeal raised concerns that a resulting decrease in helmet use might in turn lead to an increase in head injuries.

Evidence of such an increase might be available in syndromic surveillance emergency department records currently captured in the Rapid Health Information NetwOrk (RHINO) system run by the Washington State Department of Health [2]. However, patient helmet use is recorded only in triage notes – not in structured data that could counted algorithmically – and so such a study would require prohibitive amounts of manual chart review.

In this study, we created a natural language processing (NLP) algorithm [3] that can identify helmet use among triage notes for injured bicyclists who received medical care at UW Medicine facilities and applied it to triage notes from RHINO. This prepares us for future work that can apply this algorithm to all RHINO data to estimate the impact of the repeals. Specifically, we:

(1) Developed an NLP model by creating an annotated dataset from a subset of UW electronic health records (EHR) bike injury triage notes.

(2) Applied the model to UW EHR and RHINO bike injury-related triage notes to estimate the effect of helmet law repeal on bike travel safety.

Methods

Dataset

Bike-related medical encounters were identified in UW Medicine's electronic health records (EHR) using ICD-10-CM codes (Appendix A). Between April 2021 and September 2024, 2,304 bike injury-related medical visits were identified in UW Medicine's EHR; only 887 cases had triage notes (Table 1).

Between January 2018 and December 2023, 5,566 bike injury-related medical visits were identified using the RHINO bike injury surveillance query applied to RHINO data; only 2,097 of them had triage notes (Table 2).

We used the 887 UW cases and 2097 RHINO cases (named as UW dataset and RHINO dataset, respectively) to develop an automated helmet use identification mode. Specifically, we annotated cases between 2021 and 2022 (335 cases) from the UW dataset and used these to develop and train a machine learning model to algorithmically identify whether triage notes confirm helmet use. The trained model was then applied to the full UW dataset (887 cases) and the RHINO dataset.

When annotating the triage note subsets from the UW dataset, we classified triage notes into two categories: (1) the triage note indicated that the patient was wearing a helmet, and (2) the triage note asserted that the patient was not wearing helmet OR the information in the note was insufficient for inferring patients helmet status. We named these two categories as Yes and No/Not Mentioned in the result section.

Model development

In developing the model, we split the annotated dataset into a training and test set with an 8:2 ratio. We created a machine learning pipeline that first converted the input triage notes into TF-IDF (term frequency-inverse document frequency) word-vector features [4] and the outputs were provided to an XGBoost (eXtreme Gradient Boosting) classifier [5] with the training objective of determining whether the triage notes mentioned that the patient was wearing a helmet. XGBoost is a powerful machine learning algorithm based on gradient boosting that builds decision tree models sequentially to optimize performance and accuracy. We used Python 3.8 [6] as the programming language and Scikit-learn 1.6.0 for the TF-IDF implementation [7]. The XGBoost algorithm was provided by the xgboost package version 2.1.3. The data preprocessing was performed using Pandas 2.2.3 [6].

We created the pipeline using the training set and applied it to the test set to evaluate the model performance by comparing the model's prediction against human annotation. We used scikit-learn 1.6.0 to compute multiple metrics (accuracy, precision, recall, and F1, with values ranging from 0 [all failed] to 1 [perfect]) by providing it with the model's predictions and human annotations.

Finally, we applied the trained model to the full UW dataset and the RHINO datasets to investigate trends in triage note mention of helmet use over time.

Results

On the UW test dataset, the model achieved accuracy=0.87, precision=0.83, recall=0.94, and F1=0.88, which indicated that our trained model produced predictions aligned well with human annotations. We then applied the model to the UW and RHINO dataset.

Bike injury-related medical visits in UW EMR

Figure 1 shows helmet use documented in triage notes from 2021 to 2024 (Q1-Q3) in UW Medicine.

Triage notes became available in more bike-related visits in UW Medicine over time but still remained in the minority of records. Cases reporting helmet use in bike incidents (Yes) gradually increased from around 15% to above 20%, while cases reporting no helmet use or not reporting anything about helmet use also increased.

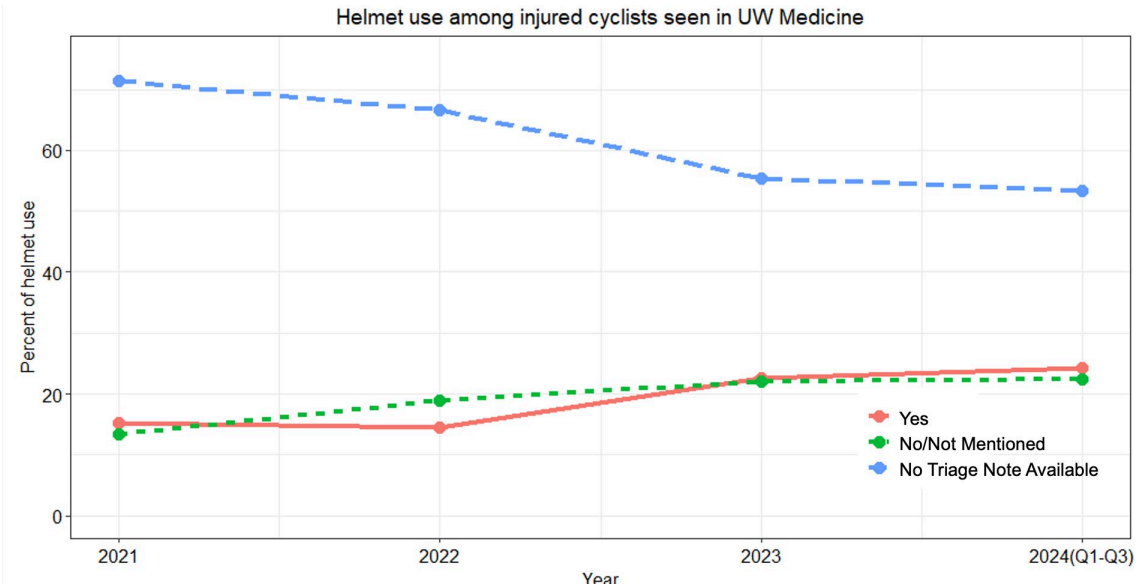

Figure 1. Overall trends of helmet status between 2021 (Q2-Q4) and 2024 (Q1-Q3) in bike-related medical visits at UW Medicine facilities. "Yes" indicates that the triage notes mentioned patients wearing a helmet, "No/Not Mentioned" indicates that triage notes mentioned patients not wearing a helmet or did not mention helmet use at all, and "No Triage Note Available" indicates that triage notes of the bike-related medical visits were not available.

Table 1. Helmet status mentioned in triage notes of bike-related medical visits between 2021 (Q2-Q4) and 2024 (Q1-Q3) in UW Medicine.

Year	Helmet status	Count (Percent)
2021	No/Not Mentioned	71 (13.4%)
	No Triage Note Available	377 (71.4%)
	Yes	80 (15.2%)
2022	No/Not Mentioned	114 (18.9%)
	No Triage Note Available	401 (66.6%)
	Yes	87 (14.5%)
2023	No/Not Mentioned	135 (22.0%)
	No Triage Note Available	340 (55.5%)
	Yes	138 (22.5%)
2024	No/Not Mentioned	126 (22.5%)
	No Triage Note Available	299 (53.3%)
	Yes	136 (24.2%)

The percentage of incidents involving female riders in which helmet use was documented more than doubled over the years (11% to 26.2%). For male riders, the percentage of notes with documented helmet use decreased in 2022 but increased in 2023 (Figure 2).

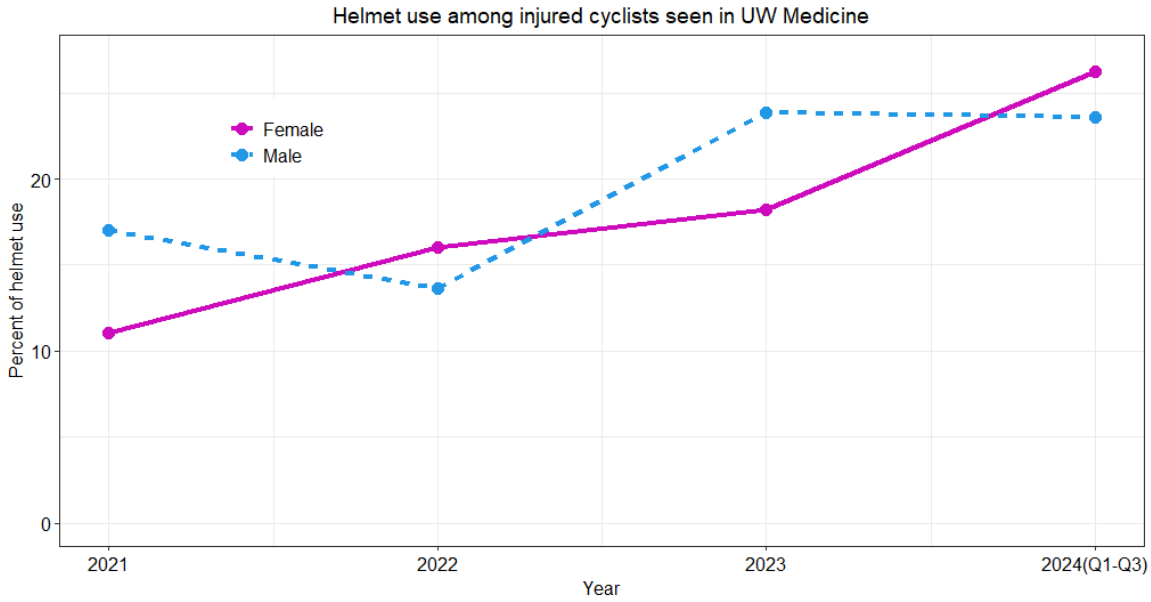

Figure 2. Percentage of notes documenting helmet use in bike-related injuries between 2021 (Q2-Q4) and 2024 (Q1-Q3) in UW Medicine by gender. The count and percentage are listed in the Appendix Tables.

The percentage of notes documenting helmet use varied among age groups. For patients aged ≤14, 25–44, and 45–64, the helmet use percentage decreased in 2022 and increased afterward. The documented helmet use percentage for patients in other age groups increased over the years (Figure 3).

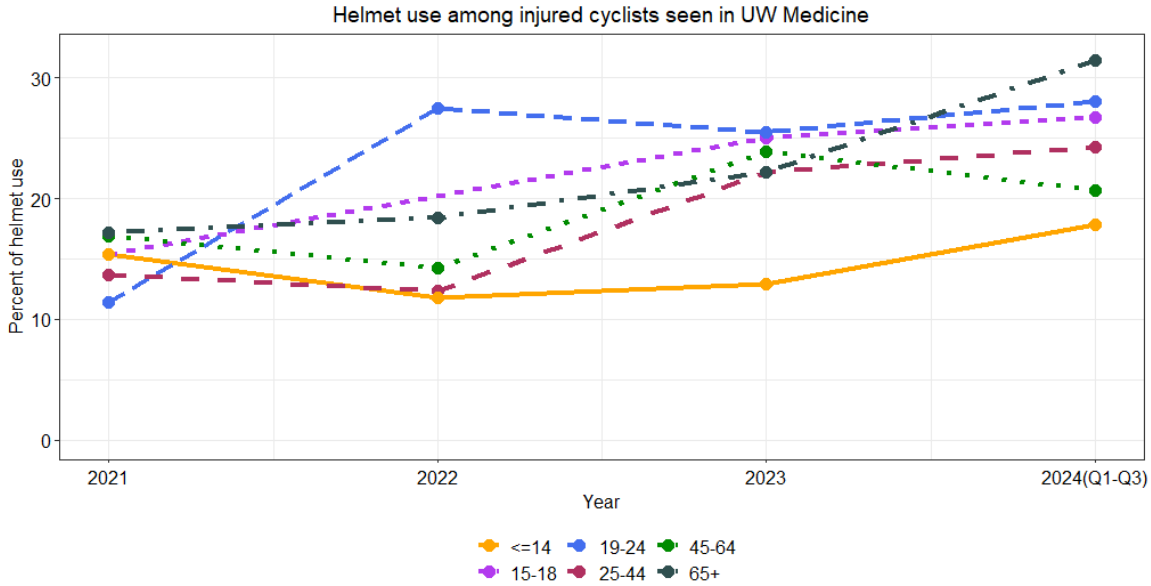

Figure 3. Percentage of notes documenting helmet use in bike-related injuries between 2021 (Q2-Q4) and 2024 (Q1-Q3) in UW Medicine by age groups. The count and percentage are listed in the Appendix Tables.

The percentage of notes documenting helmet use among bike-related ED visits decreased slightly in 2022 and increased afterward. The percentage of helmet use fluctuated among inpatient/observation visits (Figure 4).

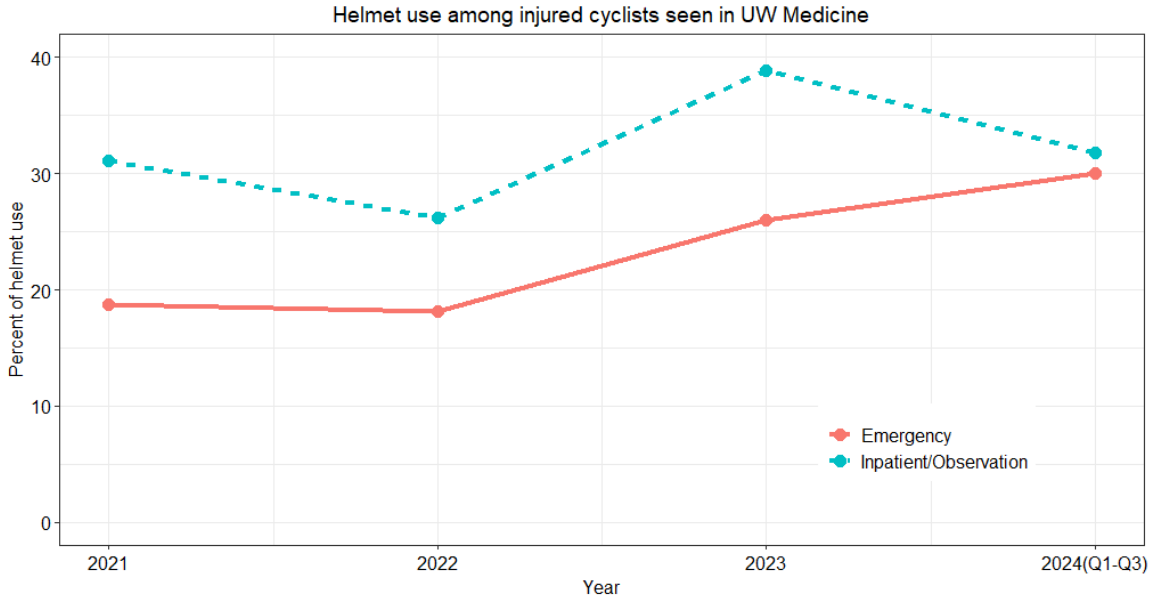

Figure 4. Percentage of notes documenting helmet use in bike-related injuries between 2021 (Q2-Q4) and 2024 (Q1-Q3) in UW Medicine by admission type. The count and percentage are listed in the Appendix Tables.

The percentage of notes documenting helmet use among bike-related visits in Harborview Medical Center and Northwest Medical Center decreased in 2022 and increased afterward. The percentage of notes documenting helmet use in bike-related visits in Montlake Medical Center has tripled over the years (4.6% to 14.5%) (Figure 5).

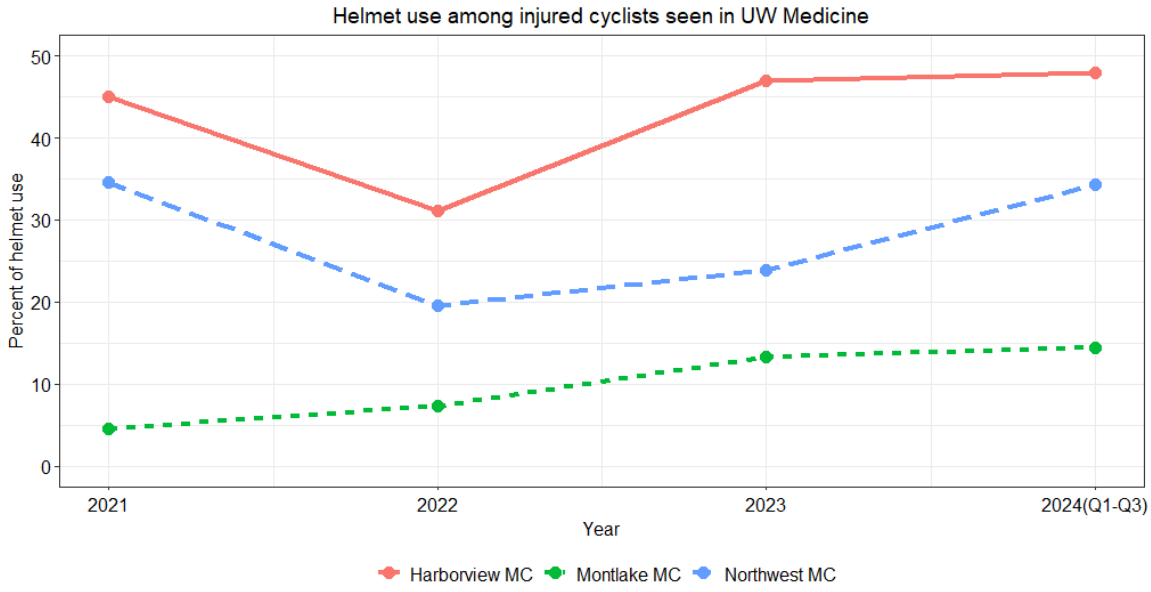

Figure 5. Percentage of notes documenting helmet use in bike-related injuries between 2021 (Q2-Q4) and 2024 (Q1-Q3) in UW Medicine by facilities. The count and percentage are listed in the Appendix Tables.

Bike injury-related medical visits in RHINO

Figure 6 shows the results of our algorithm applied to RHINO data. Notably, triage notes were less often available for more recent visits. Future studies should investigate why notes were less often available.

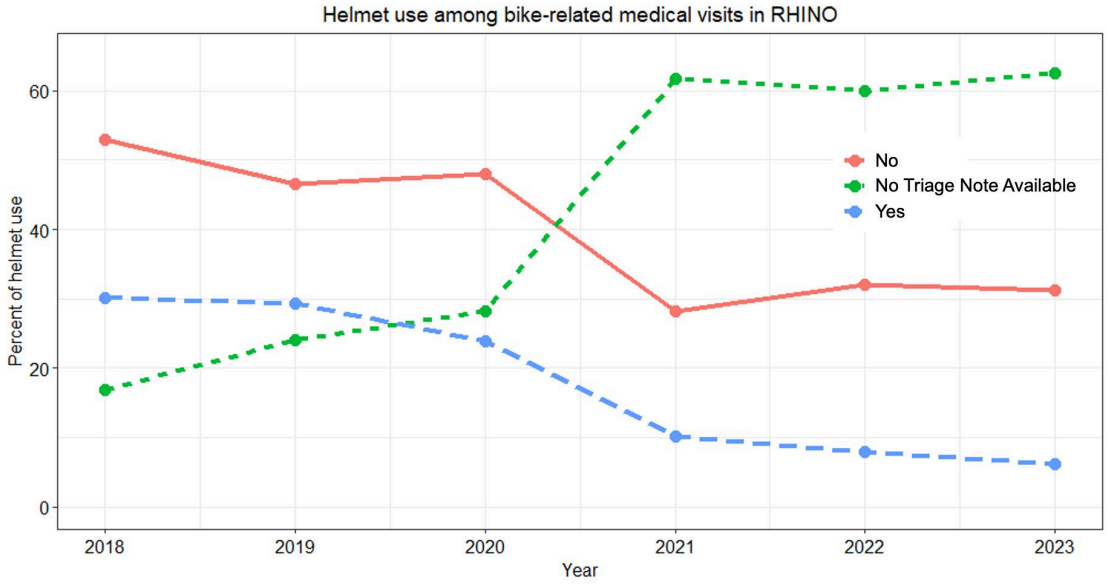

Figure 6. Overall trends of helmet status in bike-related medical visits between 2018 and 2023 statewide in WA (data source: RHINO). "Yes" represented triage notes mentioning helmet use, "No/Not Mentioned" represented triage notes mentioning helmet non-use or not mentioning helmet, and "No Triage Note Available" indicated that triage notes if the medical visits were not available.

Table 2. Counts and percentages of helmet status between 2018 and 2023 for RHINO.

Year	Helmet status	Count (Percent)
2018	No/Not Mentioned	398 (52.9%)
	No Triage Note Available	127 (16.9%)
	Yes	227 (30.2%)
2019	No/Not Mentioned	433 (46.6%)
	No Triage Note Available	224 (24.1%)
	Yes	273 (29.4%)
2020	No/Not Mentioned	389 (48.0%)
	No Triage Note Available	228 (28.1%)
	Yes	193 (23.8%)
2021	No/Not Mentioned	270 (28.1%)
	No Triage Note Available	593 (61.8%)
	Yes	97 (10.1%)
2022	No/Not Mentioned	326 (32.1%)
	No Triage Note Available	610 (60.0%)
	Yes	80 (7.9%)
2023	No/Not Mentioned	343 (31.2%)
	No Triage Note Available	687 (62.6%)
	Yes	68 (6.2%)

Conclusions

We developed a model to monitor helmet use in bike injuries over time in UW EMR and RHINO triage note data. While our model performed well on our test data, triage notes were missing for too many patient visits in RHINO to draw surveillance conclusions over time.

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Appendices

Appendix A, ICD-10-CM codes of bike-related injury

ICD-10-CM	Description	Start year
V12.3XX	Person boarding or alighting a pedal cycle injured in collision with two- or three-wheeled motor vehicle	2015
V12.4XX	Pedal cycle driver injured in collision with two- or three-wheeled motor vehicle in traffic accident	2015
V12.5XX	Pedal cycle passenger injured in collision with two- or three-wheeled motor vehicle in traffic accident	2015
V12.9XX	Unspecified pedal cyclist injured in collision with two- or three-wheeled motor vehicle in traffic accident	2015
V13.3XX	Person boarding or alighting a pedal cycle injured in collision with car, pick-up truck or van	2015
V13.4XX	Pedal cycle driver injured in collision with car, pick-up truck or van in traffic accident	2015
V13.5XX	Pedal cycle passenger injured in collision with car, pick-up truck or van in traffic accident	2015

V13.9XX	Unspecified pedal cyclist injured in collision with car, pick-up truck or van in traffic accident	2015
V14.3XX	Person boarding or alighting a pedal cycle injured in collision with heavy transport vehicle or bus	2015
V14.4XX	Pedal cycle driver injured in collision with heavy transport vehicle or bus in traffic accident	2015
V14.5XX	Pedal cycle passenger injured in collision with heavy transport vehicle or bus in traffic accident	2015
V14.9XX	Unspecified pedal cyclist injured in collision with heavy transport vehicle or bus in traffic accident	2015
V19.40X	Pedal cycle driver injured in collision with unspecified motor vehicles in traffic accident	2015
V19.49X	Pedal cycle driver injured in collision with other motor vehicles in traffic accident	2015
V19.50X	Pedal cycle passenger injured in collision with unspecified motor vehicles in traffic accident	2015
V19.59X	Pedal cycle passenger injured in collision with other motor vehicles in traffic accident	2015
V19.60X	Unspecified pedal cyclist injured in collision with unspecified motor vehicles in traffic accident	2015
V19.69X	Unspecified pedal cyclist injured in collision with other motor vehicles in traffic accident	2015
V19.9XX	Pedal cyclist (driver) (passenger) injured in unspecified traffic accident	2015
V10.0XX	Pedal cycle driver injured in collision with pedestrian or animal in nontraffic accident	2015
V10.1XX	Pedal cycle passenger injured in collision with pedestrian or animal in nontraffic accident	2015
V10.2XX	Unspecified pedal cyclist injured in collision with pedestrian or animal in nontraffic accident	2015
V10.3XX	Person boarding or alighting a pedal cycle injured in collision with pedestrian or animal	2015
V10.4XX	Pedal cycle driver injured in collision with pedestrian or animal in traffic accident	2015
V10.5XX	Pedal cycle passenger injured in collision with pedestrian or animal in traffic accident	2015
V10.9XX	Unspecified pedal cyclist injured in collision with pedestrian or animal in traffic accident	2015
V11.0XX	Pedal cycle driver injured in collision with other pedal cycle in nontraffic accident	2015
V11.1XX	Pedal cycle passenger injured in collision with other pedal cycle in nontraffic accident	2015

V11.2XX	Unspecified pedal cyclist injured in collision with other pedal cycle in nontraffic accident	2015
V11.3XX	Person boarding or alighting a pedal cycle injured in collision with other pedal cycle	2015
V11.4XX	Pedal cycle driver injured in collision with other pedal cycle in traffic accident	2015
V11.5XX	Pedal cycle passenger injured in collision with other pedal cycle in traffic accident	2015
V11.9XX	Unspecified pedal cyclist injured in collision with other pedal cycle in traffic accident	2015
V12.0XX	Pedal cycle driver injured in collision with two- or three-wheeled motor vehicle in nontraffic accident	2015
V12.1XX	Pedal cycle passenger injured in collision with two- or three-wheeled motor vehicle in nontraffic accident	2015
V12.2XX	Unspecified pedal cyclist injured in collision with two- or three-wheeled motor vehicle in nontraffic accident	2015
V13.0XX	Pedal cycle driver injured in collision with car, pick-up truck or van in nontraffic accident	2015
V13.1XX	Pedal cycle passenger injured in collision with car, pick-up truck or van in nontraffic accident	2015
V13.2XX	Unspecified pedal cyclist injured in collision with car, pick-up truck or van in nontraffic accident	2015
V14.0XX	Pedal cycle driver injured in collision with heavy transport vehicle or bus in nontraffic accident	2015
V14.1XX	Pedal cycle passenger injured in collision with heavy transport vehicle or bus in nontraffic accident	2015
V14.2XX	Unspecified pedal cyclist injured in collision with heavy transport vehicle or bus in nontraffic accident	2015
V15.0XX	Pedal cycle driver injured in collision with railway train or railway vehicle in nontraffic accident	2015
V15.1XX	Pedal cycle passenger injured in collision with railway train or railway vehicle in nontraffic accident	2015
V15.2XX	Unspecified pedal cyclist injured in collision with railway train or railway vehicle in nontraffic accident	2015
V15.3XX	Person boarding or alighting a pedal cycle injured in collision with railway train or railway vehicle	2015
V15.4XX	Pedal cycle driver injured in collision with railway train or railway vehicle in traffic accident	2015
V15.5XX	Pedal cycle passenger injured in collision with railway train or railway vehicle in traffic accident	2015
V15.9XX	Unspecified pedal cyclist injured in collision with railway train or railway vehicle in traffic accident	2015

V16.0XX	Pedal cycle driver injured in collision with other nonmotor vehicle in nontraffic accident	2015
V16.1XX	Pedal cycle passenger injured in collision with other nonmotor vehicle in nontraffic accident	2015
V16.2XX	Unspecified pedal cyclist injured in collision with other nonmotor vehicle in nontraffic accident	2015
V16.3XX	Person boarding or alighting a pedal cycle injured in collision with other nonmotor vehicle in nontraffic accident	2015
V16.4XX	Pedal cycle driver injured in collision with other nonmotor vehicle in traffic accident	2015
V16.5XX	Pedal cycle passenger injured in collision with other nonmotor vehicle in traffic accident	2015
V16.9XX	Unspecified pedal cyclist injured in collision with other nonmotor vehicle in traffic accident	2015
V17.0XX	Pedal cycle driver injured in collision with fixed or stationary object in nontraffic accident	2015
V17.1XX	Pedal cycle passenger injured in collision with fixed or stationary object in nontraffic accident	2015
V17.2XX	Unspecified pedal cyclist injured in collision with fixed or stationary object in nontraffic accident	2015
V17.3XX	Person boarding or alighting a pedal cycle injured in collision with fixed or stationary object	2015
V17.4XX	Pedal cycle driver injured in collision with fixed or stationary object in traffic accident	2015
V17.5XX	Pedal cycle passenger injured in collision with fixed or stationary object in traffic accident	2015
V17.9XX	Unspecified pedal cyclist injured in collision with fixed or stationary object in traffic accident	2015
V18.0XX	Pedal cycle driver injured in noncollision transport accident in nontraffic accident	2015
V18.1XX	Pedal cycle passenger injured in noncollision transport accident in nontraffic accident	2015
V18.2XX	Unspecified pedal cyclist injured in noncollision transport accident in nontraffic accident	2015
V18.3XX	Person boarding or alighting a pedal cycle injured in noncollision transport accident	2015
V18.4XX	Pedal cycle driver injured in noncollision transport accident in traffic accident	2015
V18.5XX	Pedal cycle passenger injured in noncollision transport accident in traffic accident	2015
V18.9XX	Unspecified pedal cyclist injured in noncollision transport accident in traffic accident	2015

V19.00X	Pedal cycle driver injured in collision with unspecified motor vehicles in nontraffic accident	2015
V19.09X	Pedal cycle driver injured in collision with other motor vehicles in nontraffic accident	2015
V19.10X	Pedal cycle passenger injured in collision with unspecified motor vehicles in nontraffic accident	2015
V19.19X	Pedal cycle passenger injured in collision with other motor vehicles in nontraffic accident	2015
V19.20X	Unspecified pedal cyclist injured in collision with unspecified motor vehicles in nontraffic accident	2015
V19.29X	Unspecified pedal cyclist injured in collision with other motor vehicles in nontraffic accident	2015
V19.3XX	Pedal cyclist (driver) (passenger) injured in unspecified nontraffic accident	2015
V19.81X	Pedal cyclist (driver) (passenger) injured in transport accident with military vehicle	2015
V19.88X	Pedal cyclist (driver) (passenger) injured in other specified transport accidents	2015

Table 1. Helmet use mentioned in the triage notes of bike-related medical visits in UW Electronic Medical Records 2021 (Q2-Q4) and 2024 (Q1-Q3) by gender.

Year	Gender	Female	Male
2021	No/Not Mentioned	18 (11.0%)	53 (14.5%)
	No Triage Note Available	127 (77.9%)	250 (68.5%)
	Yes	18 (11.0%)	62 (17.0%)
2022	No/Not Mentioned	24 (15.4%)	90 (20.4%)
	No Triage Note Available	107 (68.6%)	291 (66.0%)
	Yes	25 (16.0%)	60 (13.6%)
2023	No/Not Mentioned	33 (20.8%)	102 (22.5%)
	No Triage Note Available	97 (61.0%)	243 (53.6%)
	Yes	29 (18.2%)	108 (23.8%)
2024	No/Not Mentioned	21 (14.9%)	105 (25.0%)
	No Triage Note Available	83 (58.9%)	216 (51.4%)
	Yes	37 (26.2%)	99 (23.6%)

Table 2. Helmet use mentioned in the triage notes of bike-related medical visits in UW Electronic Medical Records 2021 (Q2-Q4) and 2024 (Q1-Q3) by age.

Year	Age	<=14	15-18	19-24	25-44	45-64	65+
2021	No/Not Mentioned	3 (11.5%)	2 (15.4%)	7 (20.0%)	30 (14.2%)	19 (11.0%)	10 (14.3%)
	No Triage Note Available	19 (73.1%)	9 (69.2%)	24 (68.6%)	153 (72.2%)	124 (72.1%)	48 (68.6%)
	Yes	4 (15.4%)	2 (15.4%)	4 (11.4%)	29 (13.7%)	29 (16.9%)	12 (17.1%)
2022	No/Not Mentioned	7 (41.2%)	3 (27.3%)	9 (22.5%)	51 (18.5%)	35 (19.2%)	8 (10.5%)
	No Triage Note Available	8 (47.1%)	8 (72.7%)	20 (50.0%)	190 (69.1%)	121 (66.5%)	54 (71.1%)
	Yes	2 (11.8%)	0 (0.0%)	11 (27.5%)	34 (12.4%)	26 (14.3%)	14 (18.4%)
2023	No/Not Mentioned	12 (38.7%)	5 (31.2%)	13 (23.6%)	63 (23.2%)	26 (14.8%)	15 (23.8%)
	No Triage Note Available	15 (48.4%)	7 (43.8%)	28 (50.9%)	148 (54.6%)	108 (61.4%)	34 (54.0%)
	Yes	4 (12.9%)	4 (25.0%)	14 (25.5%)	60 (22.1%)	42 (23.9%)	14 (22.2%)
2024	No/Not Mentioned	10 (35.7%)	3 (20.0%)	16 (32.0%)	53 (21.8%)	35 (22.6%)	9 (12.9%)
	No Triage Note Available	13 (46.4%)	8 (53.3%)	20 (40.0%)	131 (53.9%)	88 (56.8%)	39 (55.7%)
	Yes	5 (17.9%)	4 (26.7%)	14 (28.0%)	59 (24.3%)	32 (20.6%)	22 (31.4%)

Table 3. Helmet use mentioned in the triage notes of bike-related medical visits in UW Electronic Medical Records 2021 (Q2-Q4) and 2024 (Q1-Q3) care type.

Year	Care type	Emergency	Inpatient/Observation	Outpatient/urgent care
2021	No/Not Mentioned	51 (16.8%)	20 (27.0%)	0 (0.0%)
	No Triage Note Available	196 (64.5%)	31 (41.9%)	150 (100.0%)
	Yes	57 (18.8%)	23 (31.1%)	0 (0.0%)
2022	No/Not Mentioned	84 (23.5%)	30 (35.7%)	0 (0.0%)
	No Triage Note Available	209 (58.4%)	32 (38.1%)	160 (100.0%)

	Yes	65 (18.2%)	22 (26.2%)	0 (0.0%)
2023	No/Not Mentioned	102 (26.3%)	32 (35.6%)	1 (0.7%)
	No Triage Note Available	185 (47.7%)	23 (25.6%)	132 (97.8%)
	Yes	101 (26.0%)	35 (38.9%)	2 (1.5%)
2024	No/Not Mentioned	92 (25.3%)	33 (38.8%)	1 (0.9%)
	No Triage Note Available	162 (44.6%)	25 (29.4%)	112 (99.1%)
	Yes	109 (30.0%)	27 (31.8%)	0 (0.0%)

Table 4. Helmet use mentioned in the triage notes of bike-related medical visits in UW Electronic Medical Records 2021 (Q2-Q4) and 2024 (Q1-Q3) by facility.

Year	Facility	Harborview MC	Montlake MC	Northwest MC	UW primary care/urgent care
2021	No/Not Mentioned	49 (37.4%)	15 (5.8%)	7 (26.9%)	0 (0.0%)
	No Triage Note Available	23 (17.6%)	233 (89.6%)	10 (38.5%)	111 (100.0%)
	Yes	59 (45.0%)	12 (4.6%)	9 (34.6%)	0 (0.0%)
2022	No/Not Mentioned	81 (44.3%)	23 (8.0%)	10 (21.7%)	0 (0.0%)
	No Triage Note Available	45 (24.6%)	244 (84.7%)	27 (58.7%)	85 (100.0%)
	Yes	57 (31.1%)	21 (7.3%)	9 (19.6%)	0 (0.0%)
2023	No/Not Mentioned	86 (43.9%)	24 (8.9%)	24 (57.1%)	1 (1.0%)
	No Triage Note Available	18 (9.2%)	211 (77.9%)	8 (19.0%)	103 (99.0%)
	Yes	92 (46.9%)	36 (13.3%)	10 (23.8%)	0 (0.0%)
2024	No/Not Mentioned	91 (48.4%)	23 (9.8%)	12 (34.3%)	0 (0.0%)
	No Triage Note Available	7 (3.7%)	178 (75.7%)	11 (31.4%)	103 (100.0%)

	Yes	90 (47.9%)	34 (14.5%)	12 (34.3%)	0 (0.0%)