

El Paso Health Literacy Project-Study of Middle School Students in three School Districts in El Paso, Texas

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Health literacy is a major component in health care these days and it is even more important because of the lack of access to healthcare and resources for more than 60 million Americans. This component is doubly important in an area such as El Paso where the majority of people are Hispanic and do not have access to healthcare, better yet, they do not know English well enough to communicate with their health providers once they reach this level of need, which is sometimes at the emergency rooms. The El Paso Health Literacy Project provides health literacy intervention to 7 and 8 middle school students of three school districts. This health literacy intervention was evaluated by assessing health literacy and knowledge with an assessment test before and after the intervention. The intervention was for one year and demonstrated significant results.

The study targeted three major school districts, geographically located throughout the county. This project focused on mainly providing information and enhancing health awareness of 7 and 8 middle school students in the three school districts. This school age group was targeted because: (1) This age group provides the gatekeeper to the family's communication to their health providers. They provide translation into Spanish, the language spoken at home, and a member of comfort at an uncomfortable appointment (the doctor). (2) This age group is really a sponge for information; they tend to start making their own decisions about health and social issues, and form their own personality.

To start with, we needed to come up with a consensus about the definition of health literacy. For this study, we adopted the definition by the Healthy People 2010: "It is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions." Health literacy is one of the barriers to understanding health information, be it simple or complicated; another barrier is English literacy. People with limited English literacy skills lack understanding of much of the related health information given to them by health care professionals. More importantly, El Paso is 81% Hispanic; the majority of whom are at 5th grade level in their country of origin (Institute of Medicine, 2004).

Our study examined whether a health education intervention of five major topics presented in a health literacy curriculum and taught during health classes in the schools increases health literacy aptitude. It targeted three school districts: Socorro (9 middle schools), Canutillo (2 middle schools), and Ysleta (9 schools). A survey assessment tool to test health knowledge was given to students and encouraged students to answer it though it was a voluntary test before the intervention (Appendix A). Then, this same assessment test was given post-intervention to measure effectiveness of the curriculum. The reliability and validity of this instrument have been measured and proven at the pilot testing. In fall 2006, we pilot-tested the assessment and intervention before they were adopted for all schools.

The actual study was conducted during spring 2007 and spring 2008. There were more than 3200 7 and 8 middle school students participating in this intervention. The curriculum was created and formed by the principal investigator (PI), and it contains five major topics (Appendix B): (1) Community and Environmental Health, (2) Mental and Emotional Health, (3) Personal and Consumer Health, (4) Alcohol and Other Drugs, and (5) Nutrition. Each topic contained

several subtopics. This curriculum is also put on a CD offered to all health classes and schools to continue using them as either a supplement or an integral course of the health classes at each of the schools. In addition to these topics, the health literacy curriculum also provided more than 29 health topics divided into infectious, chronic, and environmental diseases and presented them in a public health perspective that targeted their preventive nature.

In spring 2007, trained health literacy personnel hired by the PI took the health literacy curriculum to the Socorro schools and initiated the assessment and the health literacy curriculum. Then, the project staff reached the other two school districts by training their health and Physical Education teachers to teach this curriculum during their regularly set hours. Pre- and post-tests were also provided to students so measurement of the intervention effectiveness was assessed.

A chi-square analysis of the almost 3000 students responding to the pre-and post-assessment test was performed. An equality of two proportions was done. As a result, a comparison of selected responses including data from all schools and within schools was detailed. There were a total of 2746 respondents to the pre-test and 3016 respondents to the post-test. The response rate was 91%.

Statistical analyses of the Socorro cohort showed that the intervention, though it was new in its implementation and novel as a concept, was extremely successful. Thirteen out of the 38 questions showed highly significant results with p-value of less than 0.0001. These items are related to medication importance, its relation to age and dosage, its side effect to allergies, its use in schools, their definition. Another item was the importance of seeking help-everywhere. One item is the importance of good communication (Attachment 1).

The Canutillo school district had two middle schools. This cohort was trained in the spring of 2008. A total of 355 respondents answered the pre-test and 349 respondents answered the post-test. Twelve out of the 38 items on the survey showed highly significant results with a p-value of less than 0.0001. The highest increase in health awareness and literacy the evident in medication and drugs severity and side effects and diet importance and interpretation and food guide pyramid (Attachment 2).

The Ysleta Independent school district had 9 middle schools participate in the intervention. A total of 1525 and 1877 participants responded to the pre-and post- tests respectively. More importantly, 23 out of 38 items on the survey test showed highly significant results with a p-value of less than 0.0001. The items that showed large increase of knowledge and health literacy were related to medication dosage, allergies, schools access to medications, definition and types of medications and illicit drugs, communication with family and friends, hygiene and overall personal health, and diet types, food groups, healthy food vs. unhealthy food (Attachment 3).

Individual statistical analyses have been conducted within each school in the three school districts. Although significant changes have been marked with few items of the survey between the pre-and post-test, the major significant statistical results have been shown in the collective sample pool per each district and the three districts overall, which makes sampling numbers a tremendous factor in the interpretation of this study.

Other findings were translated by these Action Messages:

- Reading Medication label is important.
- Medication dosage depends on age and weight.

- Medications do cause allergies.
- Parents do sometimes allow medication at school.
- Not all drugs are alike.
- Alcohol is a depressant, stay away from it.
- Alcohol can poison you.
- Do you seek help everywhere?
- The key to good relationships is good communication.
- It is not okay to share combs.
- The parts of the food guide pyramid include meat, beans and vegetables.
- Stay away from sweetened juices.

Limitations

Some limitations to this study should be mentioned: (a) It would be worth checking the effectiveness of the presence of the trained professionals in every school district, but logistical and timing constraints deterred that possibility. If these trainers were to train every student, would the impact be felt more on the individual student as well as the school, the district, and the community at large? (b) Timing of the intervention. It is worth reaching other school districts but the intervention was timed for a year. (c) Funding was another issue; mileage to travel to all schools strategically located around the county was a major undertaking and tremendous task, and personnel were not sufficient to handle it.

Benefits

This study was instrumental in many ways:

- (1) Introduced the community and health professionals to the importance of health literacy
- (2) Promoted health prevention and education
- (3) Initiated this health literacy curriculum in the schools at the 7 and 8 grade levels
- (4) Informed parents about health literacy topics through their children
- (5) Mobilized a base with great statistical health literacy data to be used as a baseline to implement health literacy in the health curricula in the state

This project was one of the objectives of a larger grant funded by the Paso Del Norte Health Foundation awarded to the division of Health career and technical education of El Paso Community College. More information and requests for health literacy workshops for the community and healthcare professionals may be found on www.epcc.edu/health, the health literacy website for the division, this project, and the community. Data are available in Spanish or English.

References

Definition of Health Literacy: Healthy People 2010. Facts and Figures from Health Literacy: Prescription to end Confusion (Institute of Medicine, 2004).

Attachments

Table 1. A comparison of selected responses to the PRE survey and the POST survey including data from all schools at Socorro District. All counts refer to correct answers. There were a total of 886 respondents to the PRE survey and 790 respondents to the POST survey

(Attachment 1).

SURVEY ITEM	PRE COUNT (%)	POST COUNT (%)	P-VALUE
1. It is not important to let pharmacists/physicians know about medications.	759 (80.4%)	693 (84.3%)	0.0323
2. Reading Medication labels is not crucial.	674 (71.4%)	678 (82.5%)	<.0001
3. Medication dosage depends on age and weight.	739 (78.3%)	755 (91.8%)	<.0001
4. Medications do not cause allergies.	755 (80.0%)	722 (87.8%)	<.0001
5. Schools do allow medications with students.	501 (53.1%)	471 (57.3%)	0.0749
6. Parents allow medication at school.	774 (82.0%)	575 (69.9%)	<.0001
7. All drugs are alike.	814 (86.2%)	755 (91.8%)	0.0002
8. Drugs are chemicals that change the way our bodies work and are transported to the blood.	396 (41.9%)	335 (40.8%)	0.6111
9. Alcohol is a depressant, a liquid and a drug.	592 (62.7%)	573 (69.7%)	0.0020
10. Alcohol can poison you.	810 (85.8%)	744 (90.5%)	0.0024
11. Diet pills are amphetamines.	530 (56.1%)	511 (62.2%)	0.0103
12. Uppers, Downers, bennies are all amphetamines.	351 (37.2%)	441 (53.7%)	<.0001
13. Mood swings are amphetamine symptoms.	604 (64.0%)	544 (66.2%)	0.3343
14. Cocaine and crack are the same.	460 (48.7%)	358 (43.6%)	0.0296
15. Cocaine is lethal.	704 (74.6%)	645 (78.5%)	0.0548
16. XTC, X, Adam, E, Roll are all forms of diet pills.	470 (49.8%)	483 (58.8%)	0.0002
17. Friends should keep secrets even if they are harmful to their families.	782 (82.8%)	714 (86.9%)	0.0191
18. Do you seek help everywhere?	600 (63.6%)	610 (74.2%)	<.0001
21. The key to good relationships is good communication.	844 (89.4%)	773 (94.0%)	0.0005
23. It is okay to share combs?	837 (88.7%)	784 (95.4%)	<.0001
25. What number do you call in case of emergency?	925 (98.0%)	819 (99.6%)	0.0018
26. The parts of the food guide pyramid include meat, beans and vegetables.	622 (65.9%)	642 (78.1%)	<.0001
27. It is better to drink sweetened juices (with sugar).	796 (4.3%)	766 (93.2%)	<.0001
28. White rice is healthier than brown rice.	302 (32.0%)	579 (70.4%)	<.0001
29. Lentils and beans are proteins.	745 (78.9%)	743 (90.4%)	<.0001
30. Calcium is found in milk.	839 (88.9%)	788 (95.9%)	<.0001
32. The best diet is none.	340 (36.0%)	419 (51.0%)	<.0001

Table 2. A comparison of selected responses to the PRE survey and the POST survey including data from only the Canutillo School District. All counts refer to correct answers. There were a total of 355 respondents to the PRE survey and 349 respondents to the POST survey. Spring 2008.

Attachment 2.

SURVEY ITEM	PRE COUNT (%)	POST COUNT (%)	P- VALUE
1. It is not important to let pharmacists/physicians know about medications.	298 (83.9)	305 (87.4)	0.0367
2. Reading Medication labels is not crucial.	299 (84.2)	314 (90.0)	0.0068
3. Medication dosage depends on age and weight.	309 (87.0)	315 (90.3)	0.0386
4. Medications do not cause allergies.	294 (82.8)	308 (88.3)	0.0105
5. Schools do allow medications with students.	240 (68.0)	244 (69.9)	0.0521
6. Parents allow medication at school.	238 (67.0)	243 (69.6)	0.0493
7. All drugs are alike.	331 (93.2)	326 (93.4)	0.1194
8. Drugs are chemicals that change the way our bodies work and are transported to the blood.	169 (47.6)	229 (65.6)	<0.0001
9. Alcohol is a depressant, a liquid and a drug.	226 (63.7)	264 (75.6)	<0.0001
10. Alcohol can poison you.	294 (82.8)	322 (92.3)	<0.0001
11. Diet pills are amphetamines.	237 (66.8)	267 (76.5)	0.0011
12. Uppers, Downers, bennies are all amphetamines.	183 (51.6)	209 (59.9)	0.0051
13. Mood swings are amphetamine symptoms.	228 (64.2)	277 (79.4)	<0.0001
14. Cocaine and crack are the same.	192 (54.1)	104 (29.8)	<0.0001
15. Cocaine is lethal.	273 (76.9)	298 (85.4)	0.0012
16. XTC, X, Adam, E, Roll are all forms of diet pills.	202 (56.9)	246 (70.5)	<0.0001
17. Friends should keep secrets even if they are harmful to their families.	283 (79.7)	316 (90.5)	<0.0001
18. Do you seek everywhere?	219 (61.7)	270 (77.4)	<0.0001
21. The key to good relationships is good communication.	320 (90.4)	329 (94.3)	0.0141
23. It is okay to share combs?	326 (91.8)	330 (94.6)	0.0430
24. It is embarrassing to speak to parents about health issues.	228 (65.1)	244 (70.5)	0.0205
25. What number do you call in case of emergency?	353 (99.4)	349 (100.0)	0.2539
26. The parts of the food guide pyramid include meat, beans and vegetables.	262 (73.8)	214 (61.3)	<0.0001
27. It is better to drink sweetened juices (with sugar).	319 (89.9)	318 (91.1)	0.0871
28. White rice is healthier than brown rice.	140 (39.4)	175 (50.1)	0.0010
29. Lentils and beans are proteins.	313 (88.2)	312 (89.4)	0.0833
30. Calcium is found in milk.	339 (95.5)	331 (94.8)	0.1286
32. The best diet is none.	151 (42.5)	270 (77.4)	<0.0001
35. The DEA is the federal agency responsible for approving use of medicines.	127 (35.8)	200 (57.3)	<0.0001
36. Cough medicines are not dangerous.	234 (65.9)	278 (79.7)	<0.0001

37. Marijuana does not cause memory loss.	277 (78.0)	261 (74.8)	0.0424
38. Heroin is a narcotic (addictive drug)	314 (88.5)	325 (93.1)	0.0106

Table 3. A comparison of selected responses to the PRE survey and the POST survey including data from Ysleta School District. All counts refer to correct answers. There were a total of 1525 respondents to the PRE survey and 1877 respondents to the POST survey. Spring 2008.
Attachment 3

SURVEY ITEM	PRE COUNT (%)	POST COUNT (%)	P-VALUE
1. It is not important to let pharmacists/physicians know about medications.	1218 (79.9)	1553 (82.7)	0.0036
2. Reading Medication labels is not crucial.	1095 (71.8)	1458 (77.7)	<0.0001
3. Medication dosage depends on age and weight.	1242 (81.4)	1644 (87.6)	<0.0001
4. Medications do not cause allergies.	1135 (74.4)	1553 (82.7)	<0.0001
5. Schools do allow medications with students.	843 (55.3)	1072 (57.1)	0.0156
6. Parents allow medication at school.	1032 (67.7)	1245 (66.3)	0.0208
7. All drugs are alike.	1275 (83.6)	1675 (89.2)	<0.0001
8. Drugs are chemicals that change the way our bodies work and are transported to the blood.	731 (47.9)	1013 (54.0)	<0.0001
9. Alcohol is a depressant, a liquid and a drug.	928 (60.9)	1305 (69.5)	<0.0001
10. Alcohol can poison you.	1190 (79.0)	1721 (91.7)	<0.0001
11. Diet pills are amphetamines.	947 (62.1)	1307 (69.6)	<0.0001
12. Uppers, Downers, bennies are all amphetamines.	790 (51.8)	1175 (62.6)	<0.0001
13. Mood swings are amphetamine symptoms.	1018 (66.8)	1379 (73.5)	<0.0001
14. Cocaine and crack are the same.	687 (45.1)	929 (49.5)	<0.0001
15. Cocaine is lethal.	1074 (70.4)	1461 (77.8)	<0.0001
16. XTC, X, Adam, E, Roll are all forms of diet pills.	764 (50.1)	930 (49.6)	0.0261
17. Friends should keep secrets even if they are harmful to their families.	1188 (77.9)	1679 (89.5)	<0.0001
18. Do you seek everywhere?	1003 (65.8)	1385 (73.8)	<0.0001
21. The key to good relationships is good communication.	1417 (92.9)	1772 (94.4)	0.0116
23. It is okay to share combs?	1398 (91.7)	1722 (91.7)	0.0497
24. It is embarrassing to speak to parents about health issues.	900 (60.3)	1103 (59.6)	0.0258
25. What number do you call in case of emergency?	1510 (99.0)	1861 (99.2)	0.1319
26. The parts of the food guide pyramid include meat, beans and vegetables.	1101 (72.2)	1400 (74.6)	0.0091
27. It is better to drink sweetened juices (with sugar).	1299 (85.2)	1665 (88.7)	<0.0001
28. White rice is healthier than brown rice.	644 (42.2)	1074 (57.2)	<0.0001
29. Lentils and beans are proteins.	1251 (82.0)	1666 (88.7)	<0.0001
30. Calcium is found in milk.	1350 (88.5)	1766 (94.1)	<0.0001
32. The best diet is none.	621 (40.7)	981 (52.3)	<0.0001
35. The DEA is the federal agency responsible for approving use of medicines.	431 (28.3)	649 (34.6)	<0.0001
36. Cough medicines are not dangerous.	868 (56.9)	1300 (69.3)	<0.0001
37. Marijuana does not cause memory loss.	1086 (71.2)	1433 (76.4)	<0.0001

38. Heroin is a narcotic (addictive drug)	1225 (80.3)	1598 (85.1)	<0.0001
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Table 4. A comparison of selected responses to the PRE survey and the POST survey including data from all schools. All counts refer to correct answers. There were a total of 1880 respondents to the PRE survey and 2226 respondents to the POST survey. Spring 2008.
Attachment 4

SURVEY ITEM	PRE COUNT (%)	POST COUNT (%)	P- VALUE
1. It is not important to let pharmacists/physicians know about medications.	1516 (80.6)	1858 (83.5)	0.0020
2. Reading Medication labels are not crucial.	1394 (74.2)	1772 (79.6)	<0.0001
3. Medication dosage depends on age and weight.	1551 (82.5)	1959 (88.0)	<0.0001
4. Medications do not cause allergies.	1429 (76.0)	1861 (83.6)	<0.0001
5. Schools do allow medications with students.	1083 (57.6)	1316 (59.1)	0.0157
6. Parents allow medication at school.	1270 (67.6)	1488 (66.9)	0.0237
7. All drugs are alike.	1606 (85.4)	2001 (89.9)	<0.0001
8. Drugs are chemicals that change the way our bodies work and are transported to the blood.	900 (47.9)	1242 (55.8)	<0.0001
9. Alcohol is a depressant, a liquid and a drug.	1154 (61.4)	1569 (70.5)	<0.0001
10. Alcohol can poison you.	1484 (78.9)	2043 (91.8)	<0.0001
11. Diet pills are amphetamines.	1184 (63.0)	1574 (70.7)	<0.0001
12. Uppers, Downers, bennies are all amphetamines.	973 (51.8)	1384 (62.2)	<0.0001
13. Mood swings are amphetamine symptoms.	1246 (66.3)	1656 (74.4)	<0.0001
14. Cocaine and crack are the same.	879 (46.8)	1033 (46.4)	0.0244
15. Cocaine is lethal.	1347 (71.7)	1759 (79.0)	<0.0001
16. XTC, X, Adam, E, Roll are all forms of diet pills.	966 (51.4)	1176 (52.8)	0.0163
17. Friends should keep secrets even if they are harmful to their families.	1471 (78.2)	1995 (89.6)	<0.0001
18. Do you seek everywhere?	1222 (65.0)	1655 (74.4)	<0.0001
21. The key to good relationships is good communication.	1737 (92.4)	2101 (94.4)	0.0019
23. It is okay to share combs?	1724 (91.7)	2052 (92.2)	0.0391
24. It is embarrassing to speak to parents about health issues.	1128 (61.2)	1347 (61.3)	0.0258
25. What number do you call in case of emergency?	1863 (99.1)	2210 (99.3)	0.1112
26. The parts of the food guide pyramid include meat, beans and vegetables.	1363 (72.5)	1614 (72.5)	0.0280
27. It is better to drink sweetened juices (with sugar).	1618 (88.1)	1983 (89.1)	<0.0001
28. White rice is healthier than brown rice.	784 (41.7)	1249 (56.1)	<0.0001
29. Lentils and beans are proteins.	1564 (83.2)	1978 (88.9)	<0.0001
30. Calcium is found in milk.	1689 (89.8)	2097 (94.2)	<0.0001
32. The best diet is none.	772 (41.1)	1251 (56.2)	<0.0001
35. The DEA is the federal agency responsible for approving use of medicines.	558 (29.7)	849 (38.1)	<0.0001
36. Cough medicines are not dangerous.	1101 (58.6)	1578 (70.9)	<0.0001
37. Marijuana does not cause memory loss.	1363 (72.5)	1694 (76.1)	<0.0001

38. Heroin is a narcotic (addictive drug)	1539 (81.9)	1923 (86.4)	<0.0001
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Appendix A: Survey Assessment tool



Health Literacy Pre-Assessment Test

Please answer accordingly:

- 1) It is not important to let pharmacists/physicians know about medications T F
- 2) Reading medication labels is not crucial T F
- 3) Medication dosage depends on age and weight T F
- 4) Medications do not cause allergies T F
- 5) Schools do allow medications with students T F
- 6) Parents allow medication at school T F
- 7) All drugs are alike T F
- 8) Drugs are:
 - a) chemicals that change the way our bodies work
 - b) transported to the blood
 - c) bad for you
 - d) a & b
- 9) Alcohol is:
 - a) a depressant
 - b) a liquid
 - c) a drug
 - d) all of the above
 - e) none of the above
- 10) Alcohol can poison you T F
- 11) Diet pills are amphetamines T F

- 12) Uppers, downers, bennies are all amphetamines T F
- 13) Mood swings are amphetamine symptoms T F
- 14) Cocaine and crack are the same T F
- 15) Cocaine is lethal T F
- 16) XTC, X, Adam, E, Roll are all forms of diet pills T F
- 17) Friends should keep secrets even if they are harmful to their families T F
- 18) Where do you seek help?
 a) at home
 b) at school
 c) in the community
 d) only "a"
 e) everywhere
- 19) Define a "friend"

- 20) What is "peer pressure"?

- 21) The key to good relationships is communication T F
- 22) What do you really need for personal hygiene?
 a) __ Shampoo
 b) __ Comb
 c) __ Brush
 d) __ Shower
 e) __ Clean clothes
 f) __ Clean nails
 g) __ All
 h) __ Other: Please specify
- 23) It is okay to share hair combs T F
- 24) It is embarrassing to speak to parents about health issues T F
- 25) What number do you call in case of an emergency?-----

- 26) The parts of the food guide pyramid are:
- a) Vegetables
 - b) Meat & Beans
 - c) Potato chips
 - d) Ketchup
 - e) All of the above
 - f) A & B
- 27) It is better to drink sweetened juices (with sugar). T F
- 28) White rice is healthier than brown rice. T F
- 29) Lentils and beans are proteins. T F
- 30) Calcium is found in Milk. T F
- 31) What is a "diet"?-----
- 32) What is the best diet?
- a) Atkins
 - b) South Beach
 - c) Dean Ornish
 - d) Jenny Craig
 - e) Slim Fast
 - f) None
 - g) All
- 33) Describe yourself- Are you
- a) Fat
 - b) Skinny
 - c) Just right
 - d) Overweight
 - e) Other, provide your answer-----
- 34) Do you eat as a family (altogether), for dinner, for example?
- a) Yes, all the time
 - b) Sometimes
 - c) Never
 - d) Other, please provide your answer-----
- 35) The DEA is the Federal agency responsible for approving use of medicines.
- a) True
 - b) False
- 36) Cough medicines are not dangerous
- a) True
 - b) False
- 37) Marijuana does not cause memory loss.
- a) True
 - b) False

38) Heroin is a narcotic (addictive drug) that can stop your breathing.

- a) True
- b) False

Appendix B: Health Literacy Middle School Curriculum

MIDDLE SCHOOL CURRICULUM



Community and Environmental Health

- Help in an Emergency
- Access to Community Health Resources
- What to do in an Emergency/Disaster
- Pollutants of Concern
- Tobacco/Uses for Tobacco/Smoking and Lung Cancer

Mental and Emotional Health

- Talking Skills
- Listening and Communication Skills
- Problem Solving Skills/Problems In Relationships

Personal and Consumer Health

- Reducing Health Risks
- Health Care/Hygiene
- Selecting and Using Healthcare Products
- Acne

Alcohol and Other Drugs

- Alcohol and Drugs
- Prescription Over The Counter Medications

Nutrition

- Nutrition
- Food Labels
- Obesity
- Anorexia
- Lupus and Nutrition
- Diet Plans
- Vegetarian Diet

Additional Health Topics

- Anemia
- Arrhythmia
- Asthma
- Avian Flu
- Body Systems
- Breast Cancer
- Cervical Cancer
- Colon Cancer
- Coronary Heart Disease
- Diabetes
- Green Tea
- Heartburn
- Hepatitis A and B
- HIV
- Hypertension
- Infancy Development
- Kidney Disease
- Liver Cirrhosis

Melanoma
Migraines
Osteoporosis
Ovarian Cancer
Rheumatoid Arthritis
SARS
SIDS
Small Pox
Stress and Its Management
Testicular Diarrhea
West Nile Virus