

!" #&/
4;O <548G=>3> 70AB>AC20==O ;V:0@AL:>3> 70A>1C
(MEPRAZOL □)

!,:04:

4VNG0 @5G>28=0: >meprazole;
1 :0?AC;0 <5?@07>;C 20 <3 3@0=C; (?5;5B) C ?5@5@0EC20==V =0 ><5?@07>;
4>?>28=8: 3@0=C;8 (?5;5B8)
A,:04 >1>;>=:8 :0?AC;8: 65;0B8=, B8B0=C 4V>:A84 (171), 5@8B@>78= (127), ?0B5=B>20=89 A8=V9 V (E 131).

V:0@AL:0 D>@<0. □0?AC;8.

A=>2=V DV78:>-EV2;0AB82>ABV: B25@4V 65;0B8=>2V :0?AC;8 2. >@?CA V :@8H5G:0 :0?AC;8
A8=L>3> :>;L>@C. 3> 4> <0965 1V;>3> :>;L>@C, AD5@8G=>W D>@<8.

\$0@<0:>B5@0?52B8G=0 3@C?0.

0A>18 4;O ;V:C20==O ?5?B8G=>W 28@07:8 B0 30AB@>57>D0350;L=>W @5D;N:A=>W E2>@>18.
=3V1VB>@8 ?@>B>==>W ?>4 ""% 02!01.

\$0@<0:>;>3VG=V 2;0AB82>ABV.

\$0@<0:>48=0

5E0=V7< 4VW. <5?@07>;, @0F5E 5=0=BV><5@V2, 7=86CT A5:@5FVN :8A;>B8 H;C=:>2>3> A>:C
7024O:8 FV;L>2>@ H;C=:>2>3> ?@>B>==>3> =0A>A0 C ?0@VTB0;L=8E ;;VB8=0E. V= H284:> 4VT B0
A?@8G8=OT :>=B@>;L=04 ?@83=VG5==O< A5:@5FVW :8A;>B8 H;C=:>2>3> A>:C ?@8 4>7C20==V 1
@07 =0 4>1C.

<5?@07>; F5 A;01:0 >A=>20, O:0 :>=F5=B@CTBLAO B0 ?5@5B2>@NTBLAO 2 0:B82=C D>@28IV
2=CB@VH=L>;VB8==8E :0=0;LFV2 C ?0@VTB0;L=8E ;;VB8=0E, 45 2>=0 ?@83=VGCT D5@<5=B + +-□
"\$-07C :8A;>B=89 =0A>A. "0:89 2?;82 =0 :V=F52C AB04VN ?@>F5AC CB2>@5==O :8A;>B8 H;C=:>2>3>
A>:C T 70;56=8< 2V4 4>78 B0 70157?5GCT 28A>:>5D5:B82=5 ?@83=VG5==O O: 1070;L=>W, B0: V AB8
20=>W A5:@5FVW :8A;>B8 =570;56=> 2V4 ?@8@>48 AB8

\$0@<0:>48=0 #AV D0@<0:>48=0 A?>AB5@V30NBLAO, <>6=0 ?>OA=8B8 2?;82>< ><5?@07>;C=0
A5:@5FVN :8A;>B8.

?;82 =0 A5:@5FVN :8A;>B8 H;C=:>2>3> A>:C.

5@>@0;L=5 4>7C20==O 20 <3 ><5?@07>;C 1 @07 =0 4>1C A?@8G8=OT H284:5 B0 5D5:B82=5
?@83=VG5==O 45==>W B0 =VG=>W A5:@5FVW :8A;>B8 H;C=:>2>3> A>:C, <0:A8<0;L=89 5D5:B
4>AO30TBLAO ?@>BO3>< 4 4=V2 ;V:C20==O. # ?0FVT=BV2 7 28@07:>N 420=04FOB8?0;>W :8H:8
A5@54=T 7=865==O :8A;>B=>ABV H;C=:0 ?@81;87=> =0 80 % 2V41C20TBLAO ?@>BO3>< 24 3>48=
?VA;O ?@89>28BL 1;87L:> 70 % G5@57 24 3>48=8 ?VA;O ?@89><5?@07>;C.

5@>@0;L=5 4>7C20==O 20 <3 ><5?@07>;C ?V4B@8N 420=04FOB8?0;>W :8H:8
2=CB@VH=L>H;C=:>289 @≥3 ?@>BO3>< A5@54=L>3> G0AC 17 3>48= 7 24-3>48==>3> ?5@V>4C.
#=0A;V4>: 7=865=>W A5:@5FVW :8A;>B8 B0 2=CB@VH=L>H;C=:>2>W :8A;>B=>ABV, 70;56=> 2V4
4>78, ><5?@07>; 7=86CT/=>@<0;V7CT :8A;>B=C 5:A?>78FVN AB@02>E>4C C ?0FVT=BV2 7
30AB@>57>D0350;L=>N @5D;N:A=>N E2>@>1>N. @83=VG5==O A5:@5FVW :8A;>B8 0A>FVNTBLAO
7 ?;>I5N :@82>W <=:>=F5=B@0FVO C ?;07AUC) ><5?@07>;C, 0 =5 7 4V9A=>N :>=F5=B@0FVTN C ?;07
V4 G0A ;V:C20==O >5?@07>;< =5 A?>AB5@V30;>AO 6>4=>W B0EVDV;0:AVW.

?;82 =0 *Helicobacter pylori* (H. @ylori).

5?B8G=0 28@07:0 0A>FVNTBLAO 7 H. @ylori, 2;;NG0NG8 28@07:C 420=04FOB8?0;>W :8H:8 B0
28@07:C H;C=:0. H. @ylori @>73;O40TBLAO O: 3>;>2=89 28@VH0;L=89 D0:B>@ C @>728B:C
30AB@8BC. H. @ylori @07>< 7 :8A;>B>N H;C=:>2>3> A>:C T 3>;>2=8<8 D0:B>@<8 C @>728B:C
?5?B8G=>W 28@07:>2>W E2>@>18. H. @ylori T >A=>2=8< D0:B>@< C @>728B:C 0B@>DVG=>3>
30AB@8BC, O:89 0A>FVNTBLAO 7 ?V428I5=8< @878:>< @>728B:C @0:C H;C=:0.
=865==O @ ?@8 70AB>AC20==V ><5?@07>;C B0 ?@>B81=8E 70A>1V2 ?>2O70=5 7V H284:8<
?>A;01;5==O< A8:8< 2V4A>B:>< 703>T==O 1C4L-O:8E C@065=L A;87>2>W >1>;>=:8 B0 7
4>23>B@820;>N @5W 28@07:>2>W E2>@>18.
=HV 5D5:B8, ?>2O70=V 7 ?@83=VG5==O< :8A;>B8.

@>B03>< 4>23>B@820;>3> ;V:C20==O ?>2V4><;O;>AO ?@> 45I> ?V428I5=C G0AB>BC ?>O28 C
H;C=:C 3@0=4C;O@=8E :VAB. &V 7;>3VG=8< =0A;V4:>< =002=>3> ?@83=VG5==O A5:@5FVW
:8A;>B8, :VAB8 T 4>1@>O:VA=8<8 B0, O: 28O2;OTBLAO, 72>@>B=8<8.
=865==O :8A;>B=>ABV C H;C=:C 70 4>?><>3>N 1C4L-O:8E 70A>1V2, 2;;NG0NG8 V=3V1VB>@8
?@>B=>=>2>3> =0A>A0, 71V;LHCT :V;L:VABL 10:B5@V9 C H;C=:C, O:V 2 =>@>.:8H:>2>Salmonella B0
Campylobacter.

0AB>AC20==O C ?54V0B@VW.

=5:>=B@>;L>20=>A;V465==V 7 CG0ABN 4VB59 (2V:>< 2V4 1 4> 16 @>:V2) 7 B06:8< 5@>782=8<
57>D03VB><, ><5?@07>; C 4>70E 0,7-1,4 <3/:3 ?>:@0I82 @V25=L 57>D03VBC C 90 % 28?04:V2 B0
7=0G=> 7<5=H82 A8<8 @5D;N:AC. # A;V?>A;V465==V 157 ?>@V2=O;L=>3> ?@5?0@0BC 4VB59 2V:><
2V4 0 4> 24 2;5=8< 4V03=>7>< 30AB@>57>D0350;L=0 @5D;N:A=0 E2>@>10 ;V:C20;8 4>70<8 0,5 <3/:3,
1,0 <3/:3 B0 1,5 <3/:3 >5?@07>;C. '0AB>B0 ?>O28 5?V7>4V2 1;N20==O/7@83C20==O 7<5=H8;0AL =0 50
% ?VA;O8 B86=V2 ;V:C20==O =570;56=> 2V4 4>78.

@048:0FVO 10:B5@VW H. @ylori C 4VB59.

@0=4>20=>42V9=>A;V465==V (4>A;V465==O Héliot) 1C2 7@>1;5=89 28A=>2>;, I> ><5?@07>; C :>
<1V=0FVW 7 42><0 0=B81V>B8:0<8 (0<>:A8F8;V=>< B0 ;;0@8B@><) 1C2 157?5G=8< B0 5D5:B82=8< C
;V:C20==V V=D5:FVW, A?@8G8=5=>W H. @ylori C 4VB59 2V:>< 2V4 4 @>:V2 B0 7 30AB@8B>H. @
ylori: 74,2 % (23/31 ?0FVT=B) C 3@C?V ?@89><5?@07>;C+0<>:A8F8;V=+;;0@8B@>@V2=O=> 7 9,4 %
(3/32 ?0FVT=B8) C 3@C?V ?@89> 6>4=>3> 4>:07C ;;V=VG=>W :>@8ABV, I> 1C;0 ?@>45<>=AB@>20=0
I>4> 48A?5?A8G=8E A8A;V465==O =5 >E>?;NT V=D>@<0FVW ?@> 4VB59 2V:>< 4> 4 @>:V2.

\$0@<0>.:V=5B8:0.

1A>@1FVO. 1A>@1FVO ><5?@07>;C T H284:>N, 7 ?V:>28<8 @V2=O<8 C ?;072V ?@81;87=> G5@57 1-2
3>48=8 ?VA;O ?@89>78. 1A>@1FVO ><5?@07>;C 2V41C20TBLAO C B>=:V9 :8HFV B0 70728G09
7025@HCTBLAO 70 3-6 3>48=. !C?CB=V9 ?@89>< W6V =5 <0T 6>4=>3> 2?;82C =0 1V>4>ABC?=VABL.
!8AB5<=0 4>ABC?=VABL (1V>4>ABC?=VABL) >5?@07>;C 7 >4=>:@0B=>W ?5@>@0;L=>W 4>78 >
<5?@07>;C AB0=>28BL ?@81;87=> 40 %. VA;O ?>2B>@=>3> 22545==O 1 @07 =0 4>1C
1V>4>ABC?=VABL 71V;LHCTBLAO ?@81;87=> 4> 60 %.

>7?>4V;.#02=89 >1T< @>7?>4V;C C 74>@>28E ;N459 AB0=>28BL ?@81;87=> 0,3 ;/:3 2038 BV;0.
2O7C20==O ><5?@07>;C 7 1V;:0<8 ?;07<8 :@>2V AB0=>28BL 97 %.

5B01>;V7 <5?@07>; ?>2=VABN<5B01>;V7CTBLAO A8AB5<>N F8B>E@><5?@07>;C 70;56VBL 2V4
CYP2C19, O:89 2V4?>2V40T 70 CB2>@5==O 3V4@>:AV><5?@07>;C, >A=>2=>3> <5B01>;VBC C ?;07
2V. '0AB8=0, I> 70;8H8;0AL, 70;568BL 2V4 V=H>W A?5F8DVG=>W V7>D>@<8, CYP3A4,
2V4?>2V40;L=>W 70 CB2>@5==O AC;LD>=C ><5?@07>;C. A:V;L:8 >5?@07>; :>=:C@5=B=> V=3V1CT
CYP2C19, VA=CT @878:<5B01>;VG=>W 270T<>4VW <5?@07>;>< B0 V=H8<8 @5G>28=0<8, <5B01>;V7
< O:8E ?>2O70=89 7 CYP2C19. 4=0: G5@57 =87L:C A?>@V4=5=VABL V7CYP3A4 ><5?@07>; =5 <0T
6>4=>3> ?>B5=FV0;C 4;O ?@83=VG5==O <5B01>;V7CYP3A4. @V< B>3>, ><5?@07>; =5 <0T
?@83=VGC20;L=>3> 2?;82C =0 >A=>2=V D5@<5=B8 CYP.

@81;87=> 3 % 1V;>H:V@>W ?>?C;OFVW B0 15-20 % 07V0BAL:8E ?>?C;OFV9 =5<0T DC=:FV>=0;L=>3>
D5@<5=BC CYP2C19. # B0:8E >AV1 <5B01>;V7< ><5?@07>;C, V<>2V@=>, 3>;>2=8< G8=><
:0B0;V7CTBLAO CYP3A4. VA;O ?>2B>@=>3> 22545==O 1 @07 =0 4>1C 20<3 ><5?@07>;C A5@54=O
AUC 1C;0 C 5-10 @07V2 1V;LH0 C ?>2V;L=8E <5B01>;V70B>@V2, =V6 C >AV1, O:V<0NBL
DC=:FV>=0;L=89 D5@<5=B CYP2C19 (H284:V <5B01>;V70B>@8). !5@54=V ?V:>2V :>=F5=B@0FVW C
?;072V 1C;8 B0:>6 28IV C 3-5 @07V2. &V @57C;LB0B8 =5 2?;820NBL =0 281V@ @5687C20==O >
<5?@07>;C.

82545==O. V=F5289 ?5@V>4 =0?V2282545==O ><5?@07>;C 7 ?;07<8 :@>2V AB0=>28BL 70728G09
<5=H5 1 3>48=8 O: ?VA;O >4=>@07>2>3>, B0: V ?VA;O ?>2B>@=8E 4>7.<5?@07>; ?>2=VABN
282>48BLAO 7 ?;07<8 :@>2V C ?@><0<8 ?@5?0@0BC 157 B5=45=FVW 4> :C4=>@07>2>W 4>1>2>W
4>78. @81;87=> 80 % ?5@>@0;L=>W 4>78 ><5?@07>;C 282>48BLAO C 283;O4V <5B01>;VBV2 V7
A5G5N, 0 @5HB0 7 D5:0;VO<8, 3>;>2=8< G8=>< 7 A5:@5FVTN 6>2GV.

@8 ?>2B>@=>7C20==V 71V;LHCTBLAO AUC ><5?@07>;C. &5 71V;LH5==O 70;568BL 2V4 4>78 B0
?@872>48BL 4> =5;V=V9=>3> 270T<>72O7:C 7>N V AUC ?VA;O ?>2B>@=>3> 4>7C20==O. "0:0
70;56=VABL 2V4 G0AC B0 4>78 ?>2O70=0 7V 7=865==O< ?5@54A8AB5<=>3> <5B01>;V7CYP2C19 >
<5?@07>;>< B0/01> 9>3> <5B01>;VB0<8 (=0?@8;:04, AC;LD>=).

5 1C;> 28O2;5=>, I> <5B01>;VB <0T 1C4L-O:89 2?;82 =0 A5:@5FVN :8A;>B8 H;C=:>2>3> A>:C.

A>1;82V ?>?C;OFVW. >@CH5==O DC=:FVW ?5GV=:8. # ?0FVT=BV2 V7 ?>@CH5==O< DC=:FVW
?5GV=:8 7AUC. <5?@07>; =5 ?@>45<=>AB@C202 6>4=>W B5=45=FVW 4> 0:C7C20==V 1 @07 =0 4>1C.
>@CH5==O DC=:FVW =8@>:. \$0@<0>:V=5B8:0 <5?@07>;C, 2;:NG0NG8 A8AB5<=C
1V>4>ABC?=VABL B0 H284:VABL 282545==O, =5 N DC=:FVTN =8@>:.
0FVT=B8 ;VB=L>3> 2V:C. (284:VABL<5B01>;V7<5?@07>;C 45I> 7=865=0 C ?0FVT=BV2 ;VB=L>3>
2V:C (75-79 @>:V2).
VB8. V4 G0A ;V:C20==O @5:<5=4>20=8<8 4>70<8 C 4VB59 2V:< 2V4 1 @>:C 1C;8 >B@8<0=V
:>=F5=B@0FVW C ?;072V, ?>4V1=V 4> :>=F5=B@0FV9 C 4>@>A;8E. # 4VB59 2V:< 4> 6<5?@07>;C T
=87L:8< G5@57 =87L:C 740B=VABL ?5@5B2>@N20B8 <5?@07>;.

;V=VG=V E0@0:B5@8AB8:8.

>:070==O.

4>@>A;8E:

- ;V:C20==O B0 ?@>DV;0:B8:0 @5F8482V2 28@07:8 420=04FOB8?0;>W :8H:8 B0 4>1@>O:VA=>W
28@07:8 H;C=:0, C B>2O70=8E V7 ?@89><< =5AB5@>W4=8E ?@>B870?0;L=8E 70A>1V2 ();
- 5@048:0FVO *Helicobacter pylori* (H. pylori) ?@8 ?5?B8G=V9 28@07FV C :<1V=0FVW 7 2V4?>2V4=8<8
0=B81V>B8:0<8;
- ;V:C20==O 30AB@>57>D0350;L=>W @5D;N:A=>W E2>@>18, C B.G. @5D;N:A-57>D03VBC;
- ;V:C20==O A8=4@>;V=35@0-□;;VA>=0.
4VB59:
4VB8 2V:>< 2V4 1 @>:C B0 <0A>N BV;0 ≥ 10 :3:
- ;V:C20==O @5D;N:A-57>D03VBC;
- A8<0B8G=5 ;V:C20==O ?5GVW B0 :8A;>B=>W @53C@3VB0FVW ?@8 30AB@>57>D0350;L=V9
@5D;N:A=V9 E2>@>1V.
VB8 2V:>< 2V4 4 @>:V2:
- C :<1V=0FVW 7 0=B81V>B8:0<8 ;V:C20==O 28@07:8 420=04FOB8?0;>W :8H:8, A?@8G8=5=>W H
. pylori.

@>B8?>:070==O.

V428I5=0 GCB;82VABL 4> <5?@07>;C, 70;V2 01> 4> 1C4L-O:>W 4>?>W @5G>28=8. <5?@07>;, O: V
V=HV V=3V1VB>@8 ?@>B>=>3> =0A>A0 (), =5 A;V4 70AB>A>2C20B8 >4=>G0A=> 7 =5;DV=02V@><
(482. «□70T<>4VO 7 V=H8<8 ;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T<>4V9»).

70T<>4VO 7 V=H8<8 ;V:0@AL:8<8 70A>10<8 B0 V=HV 2848 270T<>4V9.

?;82 <5?@07>;C =0 D0@<0>:V=5B8:C V=H8E ;V:0@AL:8E 70A>1V2.

V:0@AL:V 70A>18, 2A<>:BC20==O O:8E 70;568BL 2V4 @H;C=:0.

@83=VG5==O H;C=:>2>W A5:@5FVW ?V4 G0A ;V:C20==O <5?@07>;< B0 V=H8<8 ?@5?0@0B0<8 7
3@C?8 <>65 7=86C20B8 01> ?V428IC20B8 01A>@1FVN ;V:0@AL:8E 70A>1V2, 2A<>:BC20==O O:8E
70;568BL 2V4 @H;C=:0.

5;DV=02V@, 0B070=02V@.

;07<>2V @V2=V =5;DV=02V@C B0 0B070=02V@C 7=86CNBLAO ?@8 >4=>G0A=>AC20==V 7 >
<5?@07>;>

4=>G0A=5 70AB>AC20==O <5?@07>;C V =5;DV=02V@C ?@>B8?>:070=5. 4=>G0A=5 ?@87=0G5==O >
<5?@07>;C (40 <3 1 @07 =0 4>1C) 7=86C20;> A5@54=N 5:A?>78FVN =5;DV=02V@C ?@81;87=> =0 40
%, 0 A5@54=O 5:A?>78FVO D0@<0>;>3VG=> 0:B82=>3> <5B01>;VBC 8 7=86C20;0AO ?@81;87=> =0
75-90 %. 70T<>4VO B0:>6 <>65 1CB8 7C<>2;5=0 ?@83=VG5==O< 0:B82=>ABV CYP2C19.

4=>G0A=5 70AB>AC20==O <5?@07>;C 7 0B070=02V@>< =5 @5:<5=4CTBLAO. 4=>G0A=5
70AB>AC20==O <5?@07>;C (40 <3 1 @07 =0 4>1C) B0 0B070=02V@C C 4>7V 300 <3/@8B>=02V@C C
4>7V 100 <3 C 74>@>28E 4>1@>2>;LFV2 ?@872>48;> 4> 7=865==O =0 75 % 5:A?>78FVW
0B070=02V@C. V428I5==O 4>78 0B070=02V@C 4> 400 <3 =5 :> 2?;82 <5?@07>;C =0 5:A?>78FVN
0B070=02V@C. 4=>G0A=5 70AB>AC20==O <5?@07>;C (20 <3 1 @07 =0 4>1C) 7 0B070=02V@>< C
4>7V 400 <3/@8B>=02V@>< C 4>7V 100 <3 C 74>@>28E 4>1@>2>;LFV2 ?@872>48;> 4> 7=865==O
?@81;87=> =0 30 % 5:A?>78FVW 0B070=02V@C ?>@V2=O=> 7 0B070=02V@>< C 4>7V
300 <3/@8B>=02V@>< C 4>7V 100 <3 1 @07 =0 4>1C.

83>:A8=.

4=>G0A=5 ;V:C20==O <5?@07>;< (20 <3 =0 4>1C) B0 483>:A8=>< C 74>@>28E 4>1@>2>;LHV2
71V;LHC20;> 1V>4>ABC?=VABL 483>:A8=C =0 10 %. V4:> @5TAB@C20;8AO 28?04:8 B>:A8G=>ABV,
A?@8G8=5=>W 70AB>AC20==O< 483>:A8=C. @>B5 A;V4 4>B@815@56=>ABV ?@8 ?@87=0G5==V
28A>:8E 4>7 ><5?@07>;C ?0FVT=B0< ;VB=L>3> 2V:C. 5>1EV4=> ?>A8;8B8 B5@0?52B8G=89
;V:0@AL:89 <=>VB>@8=3 483>:A8=C.
;>?V4>3@5;L.
74>@>28E 4>1@>2>;LHV2 2V47=0G0;0AO D0@<0>:V=5B8G=0 (\$) /D0@<0>:48=0?V4>3@5;5<
(=020=B06C20;L=0 4>70 300 <3/4>1>20 ?V4B@870 75 <3) B0 <<5?@07>;< (80 <3 =0 4>1C ?5@>@0;L=>,
B>1B> 4>70, O:0 2 4 @078 ?5@528ICT AB0=40@B=C 45==C 4>7C), I> ?@872>48;0 4> 7<5=H5==O
5:A?>78FVW 0:B82=>3> <5B01>;VBC ::>?V4>3@5;N C A5@54=L>4> ::V=VG=8E ?@>02V2 FVTW \$
/\$270T<>4VW 7 B>G:8 7>@C >A=>2=8E A5@F52>-AC48==8E 70E2>@N20=L 1C;8 70@5TAB@>20=V C
E>4V ?@>2545==O >1A5@20FV9=8E V ::V=VG=8E 4>A;V465=L. /: 70?>1V6=89 70EV4 =5>1EV4=>
C=8:0B8 >4=>G0A=>3> 70AB>AC20==O <<5?@07>;C V ::>?V4>3@5;N.
=HV ;V:0@AL:V 70A>18.
A<>:BC20==O ?>A0:>=07>;C, 5@;>B8=V1C, :5B>:>=07>;C B0 VB@0:>=07>;C 7=0G=> 7<5=HCTBLAO V,
>B65, ::V=VG=0 5D5:B82=VABL <>65 ?>A;01;N20B8AO. !;V4 C=8:0B8 >4=>G0A=>3> 70AB>AC20==O 7
?>A0:>=07>;< B0 5@;>B8=V1>
V:0@AL:V 70A>18, I> <5B01>;V7CNBLAO 7 CG0ABN CYP2C19.
<5?@07>; G8=8BL ?>CYP2C19 (>A=>2=89 D5@<5=B, O:89 2V4?>2V40T 70 <5B01>;V7< <<5?@07>;C.
"0:8< G8=><, <5B01>;V7< AC?CB=VE ;V:0@AL:8E 70A>1V2, I> B0:>6<5B01>;V7CNBLAO 7 CG0ABN
CYP2C19, <>65 7<5=HC20B8AO, 0 A8AB5<=0 5:A?>78FVO F8E 70A>1V2 71V;LHC20B8AO. @8::04<
B0:8E ?@5?0@0BV2 T R-20@D0@8= B0 V=HV 0=B03>=VAB8 2VB0AB07>;, 4V075?0< V D5=VB>W=.
?>AB07>;.
74>@>28E 4>1@>2>;LHV2 70AB>AC20==O <<5?@07>;C C 4>7V 40 <3 ?V428IC20;> !max B0 AUC
F8;>AB07>;C =0 18 % B0 26 % 2V4?>2V4=>, 0 >4=>3> 7 9>3> 0:B82=8E <5B01>;VVB2 =0 29 % B0 69 %
2V4?>2V4=>.
\$5=VB>W=.
>=VB>@8=3 :>=F5=B@0FVW D5=VB>W=C C ?;072V @5:<5=4CTBLAO ?@>2>48B8 ?@>B03<<
?5@H8E 42>E B86=V2 ?VA;O ?>G0B:C ;V:C20==O <5?@07>;< B0 C 28?04:C, O:I> 1C;0 ?@>2545=0
:>@5:FVO 4>78 D5=VB>W=C, <=>VB>@8=3 B0 ?>40;LHC :>@5:FVN 4>78 ?@5?0@0BC =5>1EV4=>
?@>2>48B8 ?VA;O 70:V=G5==O ;V:C20==O <5?@07>;>
52V4><89 <5E0=V7
!0:2V=02V@.
4=>G0A=5 70AB>AC20==O <<5?@07>;C 7 A0:2V=02V@>=02V@>?@872>48;> 4> 71V;LH5==O
@V2=V2 A0:2V=02V@C C ?;072V ?@81;87=> 4> 70 %, I> 0A>FVN20;>AO 7 =0;56=>N ?5@5=>A820=8E
?0FVT=BV2.
"0:@>;V
@8 >4=>G0A=>AC20==V <<5?@07>;C ?>2V4<<O;>AO ?@> 71V;LH5==O @V2=O B0:@>;V20BFV
:@>2V. >B@V1=> ?@>2>48B8 ?>A8;5=89 <=>VB>@8=3 :>=F5=B@0FVW B0:@>;V6 DC=:FVW =8@>:
(;V@5=A :@50B8=V=C), V ?@8 =5>1EV4=>ABV 2V4:>@83C20B8 4>7C20==O B0:@>;V
5B>B@5:A0B.
>2V4<<O;>AO ?@> ?V428I5==O @V2=O <5B>B@5:A0BC C 45O:8E ?0FVT=BV2 ?@8 >4=>G0A=>@0<8
?@>B>==>3> =0A>A0. # @07V =5>1EV4=>ABV 70AB>AC20==O <5B>B@5:A0BC C 28A>:8E 4>70E
A;V4 @>73;O=CB8 ?8B0==O ?@> B82C 2V4<5?@07>;C.
?;82 V=H8E ;V:0@AL:8E 70A>1V2 =0 D0@<0>:V=5B8:C <<5?@07>;C.
=3V1VB>@8 CYP2C19 B0/01> CYP3A4.
A:V;L:8 <5?@07>; <5B01>;V7CTBLAO 70 4>?<>3>N D5@<5=BV2 CYP2C19 B0 CYP3A4, ?@5?0@0B8
I>, O: 2V4><>, ?@83=VGCNBL 0:B82=VABL CYP2C19 01> CYP3A4 (B0:V O: ::0@8B@>@8:>=07>;),
<>6CBL ?@872>48B8 4> 7@>AB0==O @V2=V2 <<5?@07>;C C A8@>20BFV :@>2V C @57C;LB0BV
C?>2V;L=5==O H284:>ABV 9>3> <5B01>;V7G0A=5 70AB>AC20==O 2>@8:>=07>;C ?@872>48;> 4>
1V;LH=V6 42>@07>2>3> 7@>AB0==O 5:A?>78FVW <5?@07>;C. A:V;L:8 28A>:V 4>78 <5?@07>;C
?5@5=>A8;8AO 4>1@5, :>@5:FVO 4>78 <5?@07>;C, O: ?@028;>, =5 ?>B@V1=0. 4=0: A;V4
@>73;O=CB8 ?8B0==O ?@> :>@5:FVN 4>78 4;O ?0FVT=BV2 7 B06:>N ?5GV=:>2>N =54>AB0B=VABN
B0 C 28?04:C 4>23>B@820;>3> ;V:C20==O.

<5?@07>; G0AB:>2> <5B01>;V7CTBLAO B0:>6 CYP3A4, 0;5 =5 ?@83=VGCT F59 D5@<5=B. "0:8< G8=>
<, ><5?@07>; =5 2?;820T=0 <5B01>;V7< ?@5?0@0BV2, I> <5B01>;V7CNBLAO CYP3A4, B0:8E O:
F8;:>A?>@8=, ;V4>:0W=, EV=V48=, 5AB@04V>;, 5@8B@>=V4.
=4C:B>@8 CYP2C19 B0/01> CYP3A4.
@5?0@0B8 I>, O: 2V4><>, V=4C:CNBL 0:B82=VABL CYP2C19 01> CYP3A4, 01> >1>E D5@<5=BV2
(B0:V O: @8D01V9), <>6CBL ?@872>48B8 4> 7=865==O @V2=V2 ><5?@07>;C 2 A8@>20BFV :@>2V C
@57C;LB0BV ?@8A:>@5==O H284:>ABV 9>3> <5B01>;V7

A>1;82>ABV 70AB>AC20==O.
@8 =002=>ABV 1C4L-O:>3> =5157?5G=>3> A83> 4V03=>7C.
4=>G0A=5 70AB>AC20==O 0B070=02V@C 7 V=3V1VB>@0<8 ?@>B>==>3> =0A>A0 =5 @5:>
<5=4CTBLAO. /:I> :><1V=0FVW 0B070=02V@C 7 V=3V1VB>@< ?@>B>==>3> =0A>A0 =5 <>6=0
C=8:=CB8, @5:><5=4CTBLAO @5B5;L=89 ;;V=VG=89 <=>VB>@8=3 (=0?@8;:04, 2V@CA=5
=020=B065==O) C ?>T4=0==V 7V 71V;LH5==O< 4>78 0B070=02V@C 4> 400 <3 =0 100 <3
@8B>=02V@C; 4>70 ><5?@07>;C =5 ?>28==0 ?5@528IC20B8 20 <3.
<5?@07>;, O: V 2AV ;V:0@AL:V 70A>18, I> ?@83=VGCNBL A5:@5FVN A>;O=>W :8A;>B8 H;C=:>2>3>
A>;C, <>65 7<5=H8B8 2A<:BC20==O 2VB0₁₂ (FV0=>:>10;0- 01> 0E;>@3V4@VN. &5 A;V4
2@0E>2C20B8 ?0FVT=B0< 7 =87L:>N <0A>N BV;0 01> D0:B>@0<8 @878:C I>4> 7=865==O 2A
<:BC20==O 2VB0₁₂ ?@8 4>23>B@820;V9 B5@0?VW.
<5?@07>; T V=3V1VB>@< CYP2C19. 0 ?>G0B:C 01> ?@8 7025@H5==V ;V:C20==O <5?@07>;<
=5>1EV4=> @>73;O=CB8 <>6;82VABL 270T<>4VW 7 ;V:0@AL:8<8 70A>10<8, I> <5B01>;V7CNBLAO 7
CG0ABN CYP2C19. 70T<>4VO A?>AB5@V30TBLAO ?V4>3@5;5< B0 ><5?@07>;>N. /: 70?>1V6=89
70EV4 =5>1EV4=> C=8:0B8 >4=>G0A=>3> 70AB>AC20==O ><5?@07>;C V ;;?>V4>3@5;N.
E2>@8E, O:V ?@89<0;8 V=3V1VB>@8 ?@>B>==>3> =0A>A0, 2;;NG0NG8 ><5?@07>;, C?@>4>26
I>=09<5=H5 B@L>E <03=VTABV 28?04:V2 3V?><03=VT@V 70AB>A>2C20;8 ?@5?0@0B 1;87L:>
@>:C). V?><03=VT7?V7=020==N B0:>3> CA;:04=5==O. # 1V;LH>ABV E2>@8E ?@>O28 3V?><03=VT@
<0;V7CTBLAO ?VA;O 70AB>AC20==O ?@5?0@0BV2<03=VN B0 2V4@V2 ?@>B>==>3> =0A>A0.
V:C20==O V=3V1VB>@0<8 ?@>B>==>3> =0A>A0 <>65 ?@8725AB8 4> 45I> ?V428I5=>3> @878:C
@>728B:C V=D5:FV9 H;C=:>2>:-:8H:>2>3> B@0:BC, A?@8G8=5=8E *Salmonella* B0 *Campylobacter*.
0FVT=B8, O:8< ?;0=CTBLAO B@820;5 70AB>AC20==O V=3V1VB>@V2 ?@>B>==>W ?> ACAC20==O
483>:A8=C, 01> V=H8E ;V:0@AL:8E 70A>1V2, O:V <>6CBL A?@8G8=8B8 7<5=H5==O 2 ?@>BO3><
;V:C20==O.
=3V1VB>@8 ?@>B>==>W ?>A>1;82> ?@8 70AB>AC20==V C 28A>:8E 4>70E B0 ?@>BO3>< B@820;>3>
G0AC (> 1 @>:C), <>6CBL 45I> ?V428I8B8 @878: ?5@5;>: 70?OAB:0 B0 AB53=0, >A>1;82> C ;N459
;VB=L>3> 2V:C B0 ?@8 =002=>ABV A?@8ONG8E D0:B>@V2.
3V4=> 7 4>A;V465==O<8 V=3V1VB>@8 ?@>B>==>W ?>6CBL ?V428I8B8 7030;L=89 @878: ?5@5;>
'0AB:>2> F5 71V;LH5==O @878:C <>65 1CB8 ?>2'O70=> 7 V=H8<8 D0:B>@0<8 @878:C. 0FVT=B8 7
@878:>< @>728B:C >AB5?>@>7C ?>28==V >B@8?><>3C 2V4?>2V4=> 4> 4VNG8E ;;V=VG=8E @5:>
<5=40FV9 B0 ?>28==V <0B8 045:20B=5 A?>6820==O 2VB0
?;82 =0 @57C;LB0B8 ;01>@0B>@=8E 4>A;V465=L.
@8 70AB>AC20==V ><5?@07>;C <>6;825 ?V428I5==O :>=F5=B@0FVW E@><>3@0=V=C (CgA).
V428I5==O :>=F5=B@0FVW CgA <>65 2?;820B8 =0 @57C;LB0B8 >1AB565=L 4;O 28O2;5==O
=59@>5=4>:@8==8E ?CE;8=. ;O 70?>1V30==O 40=>3> 2?;82C =5>1EV4=> B82> ?@878=8B8 ?@89>< >
<5?@07>;C 70 5 4=V2 4> ?@>2545==O 4>A;V465==O :>=F5=B@0FVW CgA.
5O:V 4VB8 7 E@>=VG=8<8 70E2>@N20==O<8 ?>B@51CNBL B@820;>3> ;V:C20==O, E>G0 B0:5
;V:C20==O =5 @5:><5=4>20=>.
0FVT=B8, O:V 70AB>A>2CNBL ?@5?0@0B ?@>BO3>< B@820;>3> ?5@V>4C (>A>1;82> :>;8 ?5@V>4
;V:C20==O B@820T ?@>BO3>< 1V;LH5 1 @>:C) ?>28==V 7=0E>48B8AL ?V4 @53C;O@=8< <548G=8<
=03;04>
@5?0@0B 7C, B>O:I> C ?0FVT=B0 2AB0=>2;5=0 =5?5@5=>A8>=AC;LBC20B8AO 7 ;V:0@5<, ?5@H
=V6 ?@89<0B8 F59 ;V:0@AL:89 70AV1.
V:0@AL:89 70AV1<5B8;?0@015= (219) B0 =0B@VN ?@>?V;?0@015= (217), O:V <>6CBL A?@8G8=8B8
0;5@3VG=V @50:FVW (<>6;82>, C?>2V;L=5=V).
&59 ;V:0@AL:89 70AV1

0AB>AC20==O C ?5@V>4 203VB=>ABV 01> 3>4C20==O 3@C44N.

03VB=VABL

57C;LB0B8, >B@8<0=V C E>4V B@L>E ?@>A?5:B82=8E 5?V45;>3VG=8E 4>A;V465=L (1V;LH5 1000
>B@8<0=8E @57C;LB0BV2), 2:07CNBL =0 2V4ACB=VABL =51060=>3> 2?;82C <5?@07>;C =0
203VB=VABL 01> 74>@>2O ?;>40/=>2>=0@>465=>3>.<5?@07>; <6=0 70AB>A>2C20B8 C ?5@V>4
203VB=>ABV.

>4C20==O 3@C44N

<5?@07>; ?@>=8:0T C 3@C4=5 <>;>:, ?@>B5 7 <0;>N V<>2V@=VABN<>65 2?;820B8 =0 48B8=C, O:I>
9>3> 70AB>A>2C20B8 C B5@0?52B8G=8E 4>70E.

5?@>4C:B82=0 DC=:FVO

5@>@0;L=5 70AB>AC20==O @0F5W AC<5?@07>;C ?@8 4>A;V465==OE =0 B20@8=0E =5 2?;820;> =0
@5?@>4C:B82=C DC=:FVN.

40B=VABL 2?;820B8 =0 H284:VABL @50:FVW ?@8 :5@C20==V 02B>B@0=A?>@B< 01> V=H8<8
<5E0=V7<0<8.

0;>9<>2V@=>, I> ?@5?0@0B 2?;820T =0 740B=VABL :5@C20B8 B@0=A?>@B=8<8 70A>10<8 01>
?@0FN20B8 7 <5E0=V7<0<8. >6CBL A?>AB5@V30B8AO B0:V =51060=V @50:FVW =0 70AB>AC20==O
?@5?0@0BC O: 70?0<>@>G5==O V ?>@CH5==O 7>@C. /:I> B0:V @>7;048 A?>AB5@V30NBLO,
?0FVT=B8 =5 ?>28==V :5@C20B8 B@0=A?>@B=8<8 70A>10<8 01> ?@0FN20B8 7 <5E0=V7<0<8.

!?!>AV1 70AB>AC20==O B0 4>78.

>7C20==O 4;O 4>@>A;8E.

V:C20==O B0 ?@>DV;0:B8:0 28@07:8 420=04FOB8?0;>W :8H:8 B0 4>I@>O:VA=>W 28@07:8 H;C=:0,
C B>2O70=8E 7 ?@89><>< =5AB5@>W4=8E ?@>B870?0;L=8E 70A>1V2 ()

5:><5=4>20=0 4>70 4;O ?0FVT=BV2 7 28@07:>N 420=04FOB8?0;>W :8H:8 AB0=>28BL 20<3 >
<5?@07>;C 1 @07 =0 4>1C. # 1V;LH>ABV ?0FVT=BV2 28@07:0 420=04FOB8?0;>W :8H:8 703>NTBLAO
?@>BO3<< 2 B86=V2. ;O ?0FVT=BV2, C O:8E =5 2V41C20TBLAO ?>2=>3> 703>T==O ?VA;O
?>G0B:>2>3> :C@AC, @5:><5=4CTBLAO ?>40;LH5 ;V:C20==O ?@>BO3<< 2 B86=V2. # BO6:8E 01>
@5F8482CNG8E 28?04:0E @5:><5=4CTBLAO 40 <3 ><5?@07>;C =0 4>1C V 703>T==O 70728G09
4>AO30TBLAO ?@>BO3<< 4 B86=V2.

;O ?@>DV;0:B8:8 @5F8482C 28@07:8 420=04FOB8?0;>W :8H:8 C ?0FVT=BV2 7 =530B82=8<
@57C;LB0B<< B5ABC =0 H. pylori @5:><5=4>20=0 4>70 AB0=>28BL 20<3 ><5?@07>;C 1 @07 =0 4>1C.
;O 45O:8E ?0FVT=BV2 <>65 1CB8 4>AB0B=L>N 4>1>20 4>70 10 <3*. # 28?04:C =54>AB0B=L>W
B5@0?VW 4>7C <>6=0 ?V428I8B8 4> 40 <3.

@8 ;V:C20==V 28@07:8 H;C=:0 @5:><5=4>20=0 4>70 AB0=>28BL 20<3 ><5?@07>;C 1 @07 =0 4>1C. #
1V;LH>ABV ?0FVT=BV2 28@07:0 H;C=:0 703>NTBLAO ?@>BO3<< 4 B86=V2. 0FVT=B0<, C O:8E =5
2V41C20TBLAO ?>2=>3> 703>T==O ?VA;O ?>G0B:>2>3> :C@AC, @5:><5=4>20=> ?>40;LH5 ;V:C20==O
?@>BO3<< 4 B86=V2. # BO6:8E 01> @5F8482CNG8E 28?04:0E @5:><5=4CTBLAO 40 <3 ><5?@07>;C =0
4>1C, V 703>T==O 70728G09 4>AO30TBLAO ?@>BO3<< 8 B86=V2.

;O ?@>DV;0:B8:8 @5F8482C C ?0FVT=BV2 7 28@07:>N H;C=:0 B0 =54>AB0B=L>N @50:FVTN C
2V4?>2V4L =0 ;V:C20==O @5:><5=4>20=0 4>70 AB0=>28BL 20<3 ><5?@07>;C 1 @07 =0 4>1C. @8
=5>1EV4=>ABV 4>7C <>6=0 71V;LH8B8 4> 40 <3 1 @07 =0 4>1C.

;O ;V:C20==O 28@07>: H;C=:0 B0 420=04FOB8?0;>W :8H:8, ?>2O70=8E V7 70AB>AC20==O<
=5AB5@>W4=8E ?@>B870?0;L=8E ;V:0@AL:8E 70A>1V2, @5:><5=4>20=0 4>70 AB0=>28BL 20<3 >
<5?@07>;C 1 @07 =0 4>1C. # 1V;LH>ABV ?0FVT=BV2 703>T==O =0AB0T ?@>BO3<< 4 B86=V2.
0FVT=B0<, C O:8E =5 2V41C20TBLAO ?>2=>3> 703>T==O ?VA;O ?>G0B:>2>3> :C@AC, @5:>
<5=4>20=> ?>40;LH5 ;V:C20==O ?@>BO3<< 4 B86=V2.

;O ?@>DV;0:B8:8 28@07>: H;C=:0 B0 420=04FOB8?0;>W :8H:8, ?>2O70=8E V7 70AB>AC20==O<
=5AB5@>W4=8E ?@>B870?0;L=8E ;V:0@AL:8E 70A>1V2, 4;O ?0FVT=BV2, O:V <0NBL ?V428I5=89
@878: (2V: >60 @>:V2, =0O2=VABL C<8=C;>: H;C=:0 B0 420=04FOB8?0;>W :8H:8, :@>2>B5GV C
25@E=L>2>:-8H:>2>3> B@0:BC), @5:><5=4>20=0 4>70 AB0=>28BL 20<3 ><5?@07>;C 1 @07 =0 4>1C.
@048:0FVO H. pylori ?@8 ?5?B8G=V9 28@07FV.

;O 5@048:0FVW H. @ylori ?@8 281>@V 0=B810:B5@V0;L=8E ;V:0@AL:8E 70A>1V2 A;V4
2@0E>2C20B8 V=482V4C0;L=C ?5@5=>A8B@82V4=>AB59 =0FV>=0;L=8<, @53V>=0;L=8< V

- (<5?@07>;C 20 <3 + ::0@8B@>
- (<5?@07>;C 20 <3 + ::0@8B@> 400 <3 (?@8 =5>1EV4=>ABV 500 <3 01> B8=V407>;C 500 <3)) 2
@078 =0 4>1C ?@>BO3>< 1 B86=O, 01>
-><5?@07>;C 40 <3 1 @07 =0 4>1C + (0<>:A8F8;V=C 500 <3 + <5B@>=V407>;C 400 <3 (?@8
=5>1EV4=>ABV 500 <3 01> B8=V407>;C 500 <3)) 3 @078 =0 4>1C ?@>BO3>< 1 B86=O.
V:C20==O 30AB@>57>D0350;L=>W @5D;N:A=>W E2>@>18, C B.G. @5D;N:A-57>D03VBC.
5:><5=4>20=0 4>70 AB0=>28BL 20 <3 ><5?@07>;C 1 @07 =0 4>1C. # 1V;LH>ABV ?0FVT=BV2 >4C60==O
=0AB0T ?@>BO3>< 4 B86=V2. 0FVT=B0<, C O:8E =5 2V41C20TBLAO ?>2=>3> >4C60==O ?VA;O
>G0B:>2>3> :C@AC, @5:><5=4>20=> ?>40;LH5 ;V:C20==O ?@>BO3>< 4 B86=V2. ;O ?0FVT=BV2 V7
BO6:8< 57>D03VB>< @5:><5=4CTBLAO 40 <3 ><5?@07>;C =0 4>1C, ?@8 FL>4C60==O 70728G09
4>AO30TBLAO ?@>BO3>< 8 B86=V2.
;O 4>23>B@820;>3> ;V:C20==O ?0FVT=BV2 7 30AB@>57>D0350;L=>N @5D;N:A=>N E2>@>1>N @5:>
<5=4>20=0 4>70 AB0=>28BL 10 <3* ><5?@07>;C 1 @07 =0 4>1C. @8 =5>1EV4=>ABV 4>7C <>6=0
?V428I8B8 4> 20-40 <3 ><5?@07>;C 1 @07 =0 4>1C.
@8 ;V:C20==V A857>D0350;L=>W @5D;N:A=>W E2>@>18 @5:><5=4>20=0 4>70 AB0=>28BL 20 <3 >
<5?@07>;C 1 @07 =0 4>1C. 0FVT=BC <>65 1CB8 4>AB0B=L>N 4>70 10 <3*, 4>7C A;V4 :>@83C20B8 2
V=482V4C0;L=>@O4:C. /:I>=5 4>AO30TBLAO 1060=89 @57C;LB0B ?VA;O 4 B86=V2 ;V:C20==O >
<5?@07>;>< C 4>7V 20 <3 =0 4>1C, ?0FVT=B0 A;V4 4>40B:>2> >1AB568B8.
V:C20==O A8=4@>;;V=35@0-□;;VA>=0.
;O ?0FVT=BV2 7 A8=4@><<>>;V=35@0-;;VA>=0 ?V41V@ 4>78 A;V4 ?@>2>48B8 V=482V4C0;L=>.
V:C20==O B@820T 4> 7=8:=5==O ;;V=VG=8E ?@>O2V2 E2>@>18. 5:><5=4>20=0 ?>G0B:>20 4>70
AB0=>28BL 60 <3 ><5?@07>;C 1 @07 =0 4>1C. !?>AB5@565==O 70 1V;LH =V6 90 % ?0FVT=B0<8 7
BO6:8<8 70E2>@N20==O<8 B0 =54>AB0B=L>N @50:FVTN =0 V=HV 2848 ;V:C20==O 28O28;>
5D5:B82=VABL ?V4B@8W B5@0?VW C 4>70E 20-120 <3 =0 4>1C. >1>2C 4>7C 28I5 80 <3 A;V4
@>7?>4V;8B8 B0 70AB>A>2C20B8 70 2 ?@89><8.
>7C20==O 4;O 4VB59.
VB8 2V:>< 2V4 1 @>:C B0 <0A>N BV;0 ≥10 :3.
V:C20==O @5D;N:A-57>D03VBC.
!8<0B8G=5 ;V:C20==O ?5GVW B0 :8A;>B=>W @53C@3VB0FVW ?@8 30AB@>57>D0350;L=V9
@5D;N:A=V9 E2>@>1V.

5:><5=40FVW 7 4>7C20==O:

V:	0A0 BV;0	>7C20==O
≥ 1 @>:C	10-20 :3	10 <3* 1 @07 =0 4>1C. @8 =5>1EV4=>ABV 4>7C <>6=0 ?V428I8B8 4> 20 <3 1 @07 =0 4>1C.
VBO< 7 <0A>N BV;0 ?>=04 20 :3		20 <3 1 @07 =0 4>1C. @8 =5>1EV4=>ABV 4>7C <>6=0 ?V428I8B8 4> 40 <3 1 @07 =0 4>1C.

V:C20==O @5D;N:A-57>D03VBC: B@820;VABL ;V:C20==O AB0=>28BL 4-8 B86=V2.
!8<0B8G=5 ;V:C20==O ?5GVW B0 :8A;>B=>W @53C@3VB0FVW ?@8 30AB@>57>D0350;L=V9
@5D;N:A=V9 E2>@>1V: B@820;VABL ;V:C20==O 2-4 B86=V. /:I>=5 4>AO30TBLAO 1060=89
@57C;LB0B ?VA;O 2-4 B86=V2, ?0FVT=B0 A;V4 4>40B:>2> >1AB568B8.
VB8 B0 ?V4;VB:8 2V:>< 2V4 4 @>:V2.
V:C20==O 28@07:8 420=04FOB8?0;>W :8H:8, A?@8G8=5=>WH. @ylori.
81V@ 2V4?>2V4=>W :><1V=0FV9=>W B5@0?VW ?>28=5= ?@>E>48B8 2V4?>2V4=> 4> >DV9V9=8E
=0FV>=0;L=8E, @53V>=0;L=8E B0 A>1;82>AB59 10:B5@V0;L=>W @578AB5=B=>ABV. "0:>6 A;V4
2@0E>2C20B8 B@820;VABL ;V:C20==O (2V4 7 4> 14 4=V2) B0 2V4?>2V4=5 70AB>AC20==O
0=B810:B5@V0;L=8E ?@5?0@0BV2. V:C20==O ?>28==> ?@>2>48B8AL ?V4 =03;O4><;V:0@O.

5:><5=40FVW 7 4>7C20==O:

0A0 BV;0	>7C20==O
15-30 :3	<5?@07>; 10 <3*+0<>:A8F8;V= 25 <3/:3 <0A8 BV;0 + ::0@8B@> 7,5 <3 /:3 <0A8 BV;0. @5?0@0B8 ?@89<0B8 @07>< 2 @078 =0 4>1C ?@>BO3>< 1 B86=O

31-40 :3	<5?@07>; 20 <3 + 0<>:A8F8;V= 750 <3 + ::0@8B@>
> 40 :3	<5?@07>; 20 <3 + 0<>:A8F8;V= 1000 <3 + ::0@8B@>

* - # @07V =5>1EV4=>ABV 70AB>AC20==O 4>78 10 <3 70AB>A>2C20B8 ?@5?0@0B C 2V4?>2V4=>7C20==V.

A>1;82V 3@C?8 ?0FVT=BV2.

>@CH5==O DC=:FV9 =8@>.: ;O ?0FVT=BV2 V7 ?>@CH5==O<8 DC=:FV9 =8@>: =5 ?>B@V1=> :>@83C20==O 4>78 (482. @>74V; «\$0@<0>:V=5B8:0»).

>@CH5==O DC=:FV9 ?5GV=:8. ;O ?0FVT=BV2 V7 ?>@CH5==O<8 DC=:FV9 ?5GV=:8 4>AB0B=L>N T 4>1>20 4>70 10-20 <3 (482. @>74V; «\$0@<0>:V=5B8:0»).

0FVT=B8 ;VB=L>3> 2V:C (> 65 @>:V2). ;O ?0FVT=BV2 ;VB=L>3> 2V:C =5 ?>B@V1=> :>@83C20==O 4>78 (482. @>74V; «\$0@<0>:V=5B8:0»).

5:<5=4CTBLAO ?@89<0B8 :0?AC;8 2@0=FV, 1060=> 4> W48, =5 ?>H:>46CNG8 :0?AC;C (:0?AC;8 =5 A;V4 @>76>2C20B8 G8 @>7;0N :V;L:VABN 2>48.

;O ?0FVT=BV2 7 B@C4=>I0<8 :>2B0==O B0 4;O 4VB59, O:V<>6CBL ?8B8 0I> :>2B0B8 =0?V2B25@4C W6C. 0?AC;8 <6=0 2V4:@8B8 B0 157?>A5@54=L> :>2B=CB8 2;>28=>N A;;O=:8 2>48, 01> @>7:8A;V9 @V48=V, =0?@8;;04, C 1C4L-O:>2>:C 01> O1;CG=>;5=V9 2>4V. "0:C AC1EV4=> 28?8B8 =5309=> ?VA;O ?@83>BC20==O 01> ?@>BO3>< 30 E28;8=. 5@54 ?@89><< AC2B0B8 B0 70?8B8 ?>;>28=>N A;;O=:8 2>48. 5 28:>@8AB>2C20B8 <>;>: 01> 307>20=C 2>4C.

VB8.

@5?0@0B 70AB>A>2C20B8 4VBO< 2V:< 2V4 1 @>:C B0 <0A>N BV;0 ?>=04 10 :3 70 ?@87=0G5==O< ;V:0@O 70 ?>:070==O<8 @5D;N:A-57>D03VB V A8<0B8G=5 ;V:C20==O ?5GVW B0 :8A;>B=>W @53C@3VB0FVW ?@8 30AB@>57>D0350;L=V9 @5D;N:A=V9 E2>@>1V B0 4VBO< 2V:< 2V4 4 @>:V2 4;O ;V:C20==O 28@07:8 420=04FOB8?0;>W :8H:8, 7C<>2;5=>W =0O2=VABNH. @ylori, ?V4 :>=B@>;5< ;V:0@O.

5@54>7C20==O.

V4>1<565=V 40=V I>4> 5D5:BV2 ?5@54>7C20==O <5?@07>;C C ;N48=8. # ;VB5@0BC@V 1C;8 >?8A0=V 4>7C20==O 4> 560 <3 <5?@07>;C B0 >45@60=V ?>>48=>:V ?>2V4<;5==O ?@> 4>AO3=5==O @07>2>W ?5@>@0;L=>W 4>78 C 2400 <3 <5?@07>;C (C 120 @07V2 28I5 728G09=>W @5:> <5=4>20=>W ;;V=VG=>W 4>78). >2V4<;O;>AO ?@> =C4>BC, 1;N20==O, 70?0<>@>G5==O, 014>;>2=89 1V;L. "0:>6 C ?>>48=>:8E 28?04:0E ?>2V4<;O;>AO ?@> 0?0BVN, 45?@5AVN V A?;CB0=VABL A2V4> <>ABV.

?8A0=V A8<8 <0NBL A:>@<8=CG89 E0@0:B5@. (284:VABL 282545==O =5 73> ?>@O4:C) 7V 71V;LH5==O< 4>78. V:C20==O ?@8 =5>1EV4=>ABV A8<0B8G=5.

>1VG=V @50:FVW.

09G0ABVH8<8 ?>1VG=8<8 5D5:B0<8 T 3>;>2=89 1V;L, 014>@, 4V0@5O, 74CBBO 682>B0 B0 =C4>B0 /1;N20==O. C;8 28O2;5=V 01> VA=C20;0 ?V4>7@0 ?@> =0ABC?=V 28?04:8 ?>1VG=8E @50:FV9 =0 ?@5?0@0B0B ?V4 G0A ?@>2545==O ;;V=VG=8E 28?@>1C20=L <5?@07>;C 01> ?>AB<0@:5B8=3>2>3> 70AB>AC20==O. 86G5 =02545=V ?>1VG=V @50:FVW, ;;0A8DV:>20=V C =0ABC?=V 3@C?8 2V4?>2V4=> 4> WE 2?;82C =0 >@30=8 01> A8AB5<8 >@30=V2.

I>:C A8AB5<8 :@>2V B0 ;VW A8AB5<8: ;59:>?5=VO, B@><1>F8B>?5=VO, 03@0=C;>F8B>7, ?0=F8B>?5=VO.

I>:C VW A8AB5<8: @50:FVW ?V428I5=>W GCB;82>ABV, =0?@8;;04 ;8E<0=:0, 0=3V>=52@>B8G=89 =01@O: B0 0=0DV;0:B8G=0 @50:FVO/H>:.

I>:C <5B0I>;V7 3V?>=0B@VT<03=VT<03=VT3V?><03=VT <>65 A?@8G8=8B8 3V?>:0;VT.

I>:C ?A8EV:8: 157A==O, 71C465==O, A?;CB0=VABL A2V4>>ABV, 45?@5AVO, 03@5AVO, 30;NF8=0FVW.

I>:C =5@2>2>W A8AB5<8: 3>;>2=89 1V;L, 70?0<>@>G5==O, ?0@5AB57VW, A>=;82VABL, ?>@CH5==O A<0:C.

I>:C >@30=V2 7>@C: =5GVB:VABL 7>@C.

I>:C >@30=V2 A;CEC B0 ;01V@8=BC: 25@B83>.

5A?V@0B>@=V, B>@0:0;L=V B0<54V0AB8=0;L=V ?>@CH5==O: 1@>=E>A?07

I>:C H;C=:>2>-:8H:>2>3> B@0:BC: 014>@, 4V0@5O, 74CBBO 682>B0, =C4>B0/1;N20==O, ACEVABL C @>BV, AB<0B8B, :0=484>7 H;C=:>2>-:8H:>2>3> B@0:BC, A:>?VG=89 :>;VB.
I>:C ?5GV=:8 B0 6>2G>282V4=8E H;OEV2: ?V428I5=89 @V25=L D5@<5=BV2 ?5GV=:8, 35?0B8B 7 01> 157 6>2BO=8FV, ?5GV=:>20 =54>AB0B=VABL, 5=F5D0;>?0BVO C ?0FVT=BV2 7 C65 VA=CNG>N E2>@>1>N ?5GV=:8.
I>:C H:V@8 B0 ?V4H:V@=8E B:0=8=: 45@<0B8B, A25@1V6, 28A8?, :@>?82O=:0, 0;>?5FVO, D>B>GCB;82VABL, ?>;V<>@D=0 5@8B5<0, A8=4@< !BV25=c0-6>=A>=0, B>:A8G=89 5?V45@<0;L=89 =5:@>;V7.
I>:C >?>@=>-@CE>2>3> 0?0@0BC: 0@B@0;3VO, OAB:0 01> E@51B0.
I>:C =8@>: B0 A5G>282V4=8E H;OEV2: V=B5@AB8FV0;L=89 =5D@8B.
I>:C AB0B52>W A8AB5<8 B0 <>;>G=8E 70;>7: 3V=5:><0ABVO.
030;L=V ?>@CH5==O: =574C60==O, ?5@8D5@8G=89 =01@O:, ?>A8;5=5 ?>B>284V;5==O.
0FVT=B8 48BOG>3> 2V:C.
57?5G=VABL <5?@07>;C 287=0G0;8 4;O 310 4VB59 2V:< 2V4 0 4> 16 @>:V2 7 :8A;>B>70;56=8<8 70E2>@N20==O<8. A=CNBL >1<565=V 40=V ?@> 4>23>AB@>:>2V 282G5==O 157?5:8 70AB>AC20==O ?@5?0@0BC C 46 4VB59, O:V >B@8<5?@07>;< C ?@>F5AV ;V:C20==O BO6:>3> 5@>7V9=>3> 57>D03VBC ?@>BO3< 749 4=V2. @>DV;L ?>1VG=8E @50:FV9 T AE>68< 7 ?@>DV;5< C 4>@>A;8E ?@8 :>@>B:>G0A=>23>B@820;> 0=8E I>4> 2?;82C <<5?@07>;C =0 @VAB V AB0B525 4>7@V20==O 70 @57C;LB0B0<8 B@820;>3> A?>AB5@565==O =5<0T.
"5@ABV.3 @>:8.
5 70AB>A>2C20B8 ?@5?0@0B ?VA;O 70:V=G5==O B5@ABV, 2:070=>3> =0 C?0:>2FV.
#<>28 715@V30==O.
15@V30B8 2 >@83V=0;L=V9 C?0:>2FV ?@8 B525 °!.
15@V30B8 C =54>ABC?=> 4;O 4VB59
#?0:>2:0.
> 10 :0?AC; C 1;VAB5@V.> 1 01> 3 1;VAB5@8 C ?0GFV.
0B53>@VO 2V4?CA:C. 0 @5F5?B>
8@>1=8:.
" «\$0@<0:».
VAF57=0E>465==O 28@>1=8:0 B0 9>3> 04@5A0 20465==O 4VO;L=>ABV.
#:@0W=0, 04080, <. 8W2, 2C:; \$@C=75, 74.

!" #&/
?> <548F8=A:> ?@8<5=5=8N ;5:0@AB25==>3> A@54AB20
(MEPRAZOL□)

!>AB02:
459AB2CNI55 25I5AB2>: >meprazole;
1 :0?AC;0 A>45@68B <5?@07>;0 20 <3 3@0=C; (?5;;5B) 2 ?5@5AG5B5 =0 ><5?@07>;;
2A?><>30B5;L=K5 25I5AB20: 3@0=C;K (?5;;5BK) A>45@60B: <0==8B (421); A0E0@>7C; =0B@8O 4>45F8;AC;LD0B; =0B@8O 384@>D>AD0B, 4>45:0384@0B; :0;LF8O :0@1>=0B (170); 38?@><5;>7C; A?8@B F5B8;>2K9; B8B0=0 48>:A84 (171); =0B@8O <5B8;?0@015= (219); =0B@8O ?@>?8;?0@015= (217);
A>AB02 >I>;>G:8 :0?AC;K: 65;0B8=, B8B0=0 48>:A84 (171), M@8B@>78= (127), ?0B5=B>20=K9 A8=89 V (E 131).
5:0@AB25==0O D>@<0. □0?AC;K.

A=>2=K5 D878:>-E8<8G5A:85 A2>9AB20: B2Q@4K5 65;0B8=>2K5 :0?AC;K 2. >@?CA 8 :@KH5G:0 :0?AC;K A8=53> F25B0. !>45@68<>5 :0?AC; 3@0=C;K (?5;;5BK) >B 15;>3> 4> ?>GB8 15;>3> F25B0, AD5@8G5A:>9 D>@

\$0@<0:>B5@0?52B8G5c:00 3@C??0. !@54AB20 4;O ;5G5=8O ?5?B8G5A:>9 O72K 8 30AB@>M7>D0350;L=>9 @5D;N:A=>9 1>;57=8. =3818B>@K ?@>B>==>9 ?> >4 "% 02!01.

\$0@<0:>;>38G5A:85 A2>9AB20.

\$0@<0:>48=0<8:0.

5E0=87< 459AB28O. <5?@07>;, @0F5<8G5A:0O A<5AL 42CE M=0=B8><5@>2, A=8605B A5:@5F8N :8A;>BK 65;C4>G=>3> A>:0 1;03>40@O F5;52>8759AB28O. -B> A?5F8D8G5A:89 8=3818B>@ 65;C4>G=> 3> ?@>B>==>3> =0A>A0 2 ?0@85B0;L=KE ;;5B:0E. = 1KAB@> 459AB2C5B 8 2K7K205B :>=B@>;L =04 C3=5B5=85< A5:@5F88 :8A;>BK 65;C4>G=>3> A>:0 ?@8 4>78@>2:5 1 @07 2 ACB:8. <5?@07>; MB> A;01>5 >A=>20=85, :>B>@>5 :>=F5=B@8@C5BAO 8 ?@52@0I05BAO 2 0:B82=CN D>@ 2 :8A;>9 A@545 2=CB@8;;5B>G=KE :0=0;LF52 2 ?0@85B0;L=KE ;;5B:0E, 345 >=> C3=5B05B D5@<5=B + +-"\$-07C :8A;>B=K9 =0A>A. "0:>5 2;8O=85 =0 :>=5G=CN AB048N ?@>F5AA0 >1@07>20=8O :8A;>BK 65;C4>G=>3> A>:0 7028A8<> >B 4>7K 8 >15A?5G8205B 2KA>:>MDD5:B82=>5 C3=5B5=85 :0: 1070;L=>9 , B0: 8 AB88@>20==>9 A5:@5F88 :8A;>BK =57028A8<> >B ?@8@>4K AB80.

\$0@<0:>48=0<8G5A:85 MDD5:BK. □A5 D0@<0:>48=0<8G5A:85 MDD5:BK, :>B>@K5 =01;N40NBAO, <>6=> >1JOA=8BL 2;8O=85< ><5?@07>;0 =0 A5:@5F8N :8A;>BK.

;8O=85 =0 A5:@5F8N :8A;>BK 65;C4>G=>3> A>:0.

5@>@0;L=0O 4>78@>2:0 20 <3 ><5?@07>;0 1 @07 2 ACB:8 2K7K205B 1KAB@>5 8 MDD5:B82=>5 C3=5B5=85 4=52=>9 8 =>G=>9 A5:@5F88 :8A;>BK 65;C4>G=>3> A>:0, <0:A8<0;L=K9 MDD5:B 4>A B8305BAO 2 B5G5=85 4 4=59 ;5G5=8O. # ?0F85=B>2 A O72>9 425=04F0B8?5@AB=>9 :8H:8 A@54=55 A =865=85 :8A;>B=>AB8 65;C4:0 ?@81;878B5;L=> =0 80 % ?@>8AE>48B 2 B5G5=85 24 G0A>2 ?>A;5 ?@85<0 20 <3 ><5?@07>;0, A@54=55 A=865=85 ?8:>2>3> 2K1@>A0 :8A;>BK ?>A;5 AB888 ?5=B030AB@8=0 A>AB02;O5B >:>;> 70 % G5@57 24 G0A0 ?>A;5 ?@85<0 ><5?@07>;0. 5@>@0;L=0O 4>78@>2:0 20 <3 ><5?@07>;0 ?>445@68205B C ?0F85=B>2 A O72>9 425=04F0B8? 5@AB=>9 :8H:8 2=CB@865;C4>G:>2K9 @>3 2 B5G5=85 A@54=53> 2@5<5=8 17 G0A>2 87 24- G0A>2>3> ?5@8>40. A;54AB285 A=865==>9 A5:@5F88 :8A;>BK 8 2=CB@865;C4>G=>9 :8A;>B=>AB8, 2 7028A8<>AB8 >B 4>7K, ><5?@07>; A=8605B/=>@<0;87C5B :8A;>B=CN M:A?>78F8N ?8I52>40 C ?0F85 =B>2 A 30AB@>M7>D0350;L=>9 @5D;N:A=>9 1>;57=LN. #3=5B5=85 A5:@5F88 :8A;>BK 0AA>F88@C5 BAO A ?;>I04LN :@82>9 «:>=F5=B@0F8O 2 ?;07<5 2@5» (AUC) ><5?@07>;0, 0 =5 A 459AB28B5;L=>9 :>=F5=B@0F859 2 ?;07<5 2 40==>5 2@5.

> 2@5 ><5?@07>;< =5 =01;N40;>AL =8 >4=>9 B0E8D8;0:A88.

;8O=85 =0 *Helicobacter pylori* (H. @ylori).

5?B8G5A:0O O720 0AA>F88@C5BAO A H. @ylori, 2;;NG0O O72C 425=04F0B8?5@AB=>9 :8H:8 8 O72C 65;C4:0. H. @ylori @0AA<0B@8205BAO :0: 3;02=K9 @5H0NI89 D0:B>@ 2 @0728B88 30AB@8B0. H. @ylori 2<5AB5 A :8A;>B>9 65;C4>G=>3> A>:0 O2;ONBAO 3;02=K<8 D0:B>@<0 8 2 @0728B88 ?5?B8G 5A:>9 O725==>9 1>;57=8. H. ylori O2;O5BAO >A=>2=K< D0:B>@< 2 @0728B88 0B@>D8G5A:>3> 30AB@8B0, :>B>@K9 0AA>F88@C5BAO A ?>2KH5==K< @8A:>< @0728B8O @0:0 65;C4:0. !=865=85 @ ?@8 ?@8<5=5=88 ><5?@07>;0 8 ?@>B82><8:@>1=KE A@54AB2 A2O70=> A 1KAB@K< >A;01;5=85< A8<>2, A 2KA>:8< ?@>F5=B< 70682;5=8O :0:8E-;81> ?>@065=89 A;878AB>9 >1>;>G:8 8 A 4;8B5;L=>9 @5<8AA859 ?5?B8G5A:>9 O725==>9 1>;57=8.

@C385 MDD5:BK, A2O70==K5 A C3=5B5=85< :8A;>BK.

B5G5=85 4;8B5;L=>3> ;5G5=8O A>>1I0;>AL > =5A:>;L:> ?>2KH5==>9 G0AB>B5 ?>O2;5=8O 2 65;C4:5 3@0=4C;O@=KE :8AB. -B8 87<5=5=8O O2;ONBAO D878>;>38G5A:8< A;54AB285< ?@8ACBAB2CNI53> C3=5B5=8O A5:@5F88 :8A;>BK, :8ABK 4>1@>:0G5AB25==K5 8, :0: >:07K205BAO, >1@0B8.

!=865=85 :8A;>B=>AB8 2 65;C4:5 A ?><>ILN ;N1KE A@54AB2, 2;;NG0O 8=3818B>@K ?@>B>==>2>3> =0A>A0, C25;8G8205B :>;8G5AB2> 10:B5@89 2 65;C4:5, :>B>@K5 2 =>@<5 ?@8ACBAB2CNB 2 65;C4>G=>:-:8H5G=>< B@0:B5. 5G5=85 ?@5?0@0B0<8, A=860NI8<8 :8A;>B=>ABL, <>65B ?@825AB8 : =5A:>;L:> ?>2KH5==> @8A:C 65;C4>G=>:-:8H5G=KE 8=D5:F89, =0?@8<5@, 2K720==KE *Salmonella* 8 *Campylobacter*.

@8<5=5=85 2 ?5480B@88.

=5:>=B@>;8@C5<< 8AA;54>20=88 A CG0AB85< 45B59 (>B 1 4> 16 ;5B) A B065;K< M@>782=K< M

7>D038B><, ><5?@07>; 2 4>70E 0,7-1,4 <3/:3 C;CGH8; C@>25=L M7>D038B0 2 90 % A;CG052 8 7=0G 8B5;L=> C<5=LH8; A8<K @5D;N:A0. A;5?>< 8AA;54>20=88 157 A@02=8B5;L=>3> ?@5?0@0B0 45B59 >B 0 4> 24 <5AOF52 A CAB0=>2;5==K< 4803=>7>< 30AB@>M7>D0350;L=0O @5D;N:A=0O 1>;57=L ; 5G8;8 4>70<8 0,5 <3/:3, 1,0 <3/:3 8 1,5 <3/:3 >5?@07>;0. '0AB>B0 ?>O2;5=8O M?87>4>2 @2>BK/A@K38 20=8O C<5=LH8;0AL =0 50 % ?>A;5 8=545;L ;5G5=8O =57028A8<> >B 4>7K.

-(@048:0F8O 10:B5@89 H. @ylori C 45B59.

@0=4><878@>20==>< 42>9=>< A;5?>< ;8=8G5A:>< 8AA;54>20=88 (8AA;54>20=85 Héliot) 1K; A45;0= 2K2>4, GB> ><5?@07>; 2 :><18=0F88 A 42CB8:0<8 (0<>:A8F8;;8=>< 8 :;0@8B@><8F8=><) 1K;

157>?0A=K< 8 MDD5:B82=K< 2 ;5G5=88 8=D5:F88, 2K720==>9 H. @ylori C 45B59 A 4 ;5B 8 A 30AB@8B>A:>@>ABL C=8GB>65=8O H. @ylori: 74,2 % (23/31 ?0F85=B) 2 3@C??5 ?@85<0 > <5?@07>;0+0<>:A8F8;;8=+;0@8B@><8F8=, ?> A@02=5=8N A 9,4 % (3/32 ?0F85=B0) 2 3@C??5 ?@85< 0 0<>:A8F8;;8=0+;0@8B@><8F8=. 4=0:> =5 1K;> =8:0>3> 4>:070B5;LAB20 ;8=8G5A:>9 ?>;L7K, :>B>@0O 1K;0 ?@>45<=>AB@8@>20=0 >B=>A8B5;L=> 48A?5?A8G5A:8E A8<>2. -B> 8AA;54>20=85 =5 >E20BK205B 8=D>@<0F8N > 45BOE 4> 4 ;5B.

\$0@<0:>:8=5B8:0.

1A>@1F8O. 1A>@1F8O ><5?@07>;0 1KAB@0O, A ?8:>2K<8 C@>2=O<8 2 ?;07<5 :@>28 ?@81;878B5;L => G5@57 1-2 G0A0 ?>A;5 ?@85<0 4>7K. 1A>@1F8O ><5?@07>;0 ?@>8AE>48B 2 B>=>:9 :8H:5 8 >1KG=> 7025@H05BAO 70 3-6 G0A>2. !>?CBAB2CNI89 ?@85< ?8I8 =5 8<55B =8:0>3> 2;8O=8O =0 18 >4>ABC?=>ABL. !8AB5<=0O 4>ABC?=>ABL (18>4>ABC?=>ABL) ><5?@07>;0 87 >4=>:@0B=>9 ?5@>@0;L=>9 4>7K ><5?@07>;0 A>AB02;O5B ?@81;878B5;L=> 40 %. >A;5 ?>2B>@=>3> 22545=8O 1 @07 2 ACB:8 18>4>ABC?=>ABL C25;8G8205BAO ?@81;878B5;L=> 4> 60 %.

0A?@545;5=85. @54AB02;O5 >1J5< @0A?@545;5=8O C 74>@>2KE ;N459 A>AB02;O5B ?@81;878B5;L => 0,3 ;/:3 <0AAK B5;0. !2O7K20=85 ><5?@07>;0 A 15;0<8 ?;07<K :@>28 A>AB02;O5B 97 %.

5B01>;87 <5?@07>; ?>;=>ABLN <5B01>;878@C5BAO A8AB5<>9 F8B>E@><0 450. >;LH0O G0ABL <5B01>;87<0 ><5?@07>;0 7028A8B >B CYP2C19, :>B>@K9 >B25G05B 70 >1@07>20=85 384@>:A8> <5?@07>;0, >A=>2=>3> <5B01>;8B0 2 ?;07<5 :@>28. AB02H0OAO G0ABL 7028A8B >B 4@C3>9 A?5F8D 8G5A:>9 87>D>@<K, CYP3A4, >B25BAB25==>9 70 >1@07>20=85 AC;LD>=0 ><5?@07>;0. >A:>;L:C > <5?@07>; ;>=:C@5=B=> 8=3818@C5B CYP2C19, ACI5AB2C5B @8A: <5B01>;8G5A:>3> 2708<>4 59AB28O <564C ><5?@07>;>< 8 4@C38<8 2515AB20<8, <5B01>;87< :>B>@KE A2O70= A CYP2C19. 4=0: > 87-70 =87:>3> A@>4AB20 A CYP3A4 ><5?@07>; =5 8<55B =8:0>3> ?>B5=F80;0 4;O C3=5B5=8O <5B01>;87<0 4@C38E AC1AB@0B>2 CYP3A4. @><5 B>3>, ><5?@07>; =5 8<55B C3=5B0NI53> 2;8O=8O =0 >A=>2=K5 D5@<5=BK CYP.

@81;878B5;L=> 3 % 15;>:659 ?>?C;OF88 8 15-20 % 0780BA:8E ?>?C;OF89 =5 8<55B DC=:F8>=0;L=>3> D5@<5=B0 CYP2C19. # B0:8E ;8F <5B01>;87< ><5?@07>;0, 25@>OB=>, 3;02=K< >1@07>< :0B0;878@C5 BAO CYP3A4. >A;5 ?>2B>@=>3> 22545=8O 1 @07 2 ACB:8 20 <3 ><5?@07>;0 A@54=OO AUC 1K;0 2 5-10 @07 1>;LH5 C <54;5==KE <5B01>;870B>@>2, G5< C ;8F, :>B>@K5 8<5NB DC=:F8>=0;L=K9 D5@ <5=B CYP2C19 (1KAB@K5 <5B01>;870B>@K). !@54=85 ?8:>2K5 :>=F5=B@0F88 2 ?;07<5 :@>28 1K;8 B0:65 2KH5 2 3-5 @07. -B8 @57C;LB0BK =5 2;8ONB =0 2K1>@ @568<0 4>78@>20=8O ><5?@07>;0. K2545=85. >=5G=K9 ?5@8>4 ?>;C2K2545=8O ><5?@07>;0 87 ?;07<K :@>28 A>AB02;O5B >1KG=> <5=L H5 1 G0A0 :0 ?>A;5 >4=>:@0B=>3>, B0: 8 ?>A;5 ?>2B>@=KE 4>7. <5?@07>; ?>;=>ABLN 2K2>48BAO 8 7 ?;07<K :@>28 2 ?@><56CB:0E <564C ?@85<0<8 ?@5?0@0B0 157 B5=45=F88 : :C88 ?>A;5 ?@85<0 >4=> :@0B=>9 ACB>G=>9 4>7K. @81;878B5;L=> 80 % ?5@>@0;L=>9 4>7K ><5?@07>;0 2K2>48BAO 2 2845 <5B01>;8B>2 A <>G>9, 0 >AB0;L=>5 A D5:0;8O<8, 3;02=K< >1@07>< A A5:@5F859 65;G8.

@8 ?>2B>@=>9 4>78@>2:5 C25;8G8205BAO AUC ><5?@07>;0. -B> C25;8G5=85 7028A8B >B 4>7K 8 ?@82>48B : =5;8=59=>9 2708<>A2O78 <564C 4>7>9 8 AUC ?>A;5 ?>2B>@=>9 4>78@>2:8. "0:0O 7028A8 <>ABL >B 2@5<5=8 8 4>7K A2O70=0 A> A=865=85< ?@54A8AB5<=>3> <5B01>;87<0 8 A8AB5<=>3> ;8 @5=A0, 2>7<>6=>, 2K720==>3> C3=5B5=85< D5@<5=B0 CYP2C19 ><5?@07>;>< 8/8;8 53> <5B01>;8B0 <8 (=0?@8<5@, AC;LD=>).

5 1K;> 2KO2;5=>, GB> <5B01>;8B 8<55B :0:>5->;81> 2;8O=85 =0 A5:@5F8N :8A;>BK 65;C4>G=>3> A>:0. A>1K5 ?>?C;OF88. 0@CH5=8O DC=:F88 ?5G5=8. # ?0F85=B>2 A =0@CH5=85< DC=:F88 ?5G5=8 87<5= O5BAO <5B01>;87< ><5?@07>;0, ?@82>4O : C25;8G5=8N AUC. <5?@07>; =5 ?@>45<=>AB@8@>20; =8:0>9 B5=45=F88 : 0::C88 ?@8 4>78@>2:5 1 @07 2 ACB:8.

0@CH5=8O DC=:F88 ?>G5:. \$0@<0:>:8=5B8:0 ><5?@07>;0, 2;;NG0O A8AB5<=CN 18>4>ABC?=>ABL 8 A:>@>ABL 2K2545=8O, =5 87<5=O5BAO C ?0F85=B>2 A> A=865==>9 DC=:F859 ?>G5:.

0F85=BK ?>68;>3> 2>7@0AB0. !:>@>ABL <5B01>;87<0 ><5?@07>;0 =5A>;L:> A=865=0 C ?0F85=B>2 ?>68;>3> 2>7@0AB0 (75-79 ;5B).
5B8. > 2@5 ;5G5=8O @5:><5=4>20==K<8 4>70<8 C 45B59 A 1 3>40 1K;8 ?>;CG5=K :>=F5=B@0F88 2 ?;07 <5 :@>28, ?>4>1=K5 :>=F5=B@0F8O< C 27@>A;KE. # 45B59 4> 6 <5AOF52 ;;8@5=A ><5?@07>;0 =87:89 87-70 =87:>9 A?>A>1=>AB8 ?@52@0I0BL ><5?@07>;.

;8=8G5A:85 E0@0:B5@8AB8:8.
>:070=8O.

27@>A;KE:
- ;5G5=85 8 ?@>D8;0:B8:0 @5F8482>2 O72K 425=04F0B8?5@AB=>9 :8H:8 8 4>1@>:0G5AB25==>9 O72K 65;C4:0, 2 B>< G8A;5 A2O70==KE A ?@85<>< =5AB5@>84=KE ?@>B82>2>A?0;8B5;L=KE A@54AB2 (!);
- M@048:0F8O *Helicobacter pylori* (H. pylori) ?@8 ?5?B8G5A:>9 O725 2 :><18=0F88 A A>>B25BAB2CNI8 <8 0=B818>B8:0<8;
- ;5G5=85 30AB@>M7>D0350;L=>9 @5D;N:A=>9 1>;57=8, 2 B.G. @5D;N:A-M7>D038B0;
- ;5G5=85 A8=4@><0 >;;8=35@0--;;8A>=0.

45B59:
45B8 A 1 3>40 8 <0AA>9 B5;0 ≥10 :3:
- ;5G5=85 @5D;N:A-M7>D038B0;
- A8<0B8G5A:>5 ;5G5=85 876>38 8 :8A;>B=>9 @53C@38B0F88 ?@8 30AB@>M7>D0350;L=>9 @5D;N:A=>9 1>;57=8.
5B8 A 4 ;5B:
- 2 :><18=0F88 A 0=B818>B8:0<8 ;5G5=85 O72K 425=04F0B8?5@AB=>9 :8H:8, 2K720==>9 *H. pylori*

@>B82>?>:070=8O.
>2KH5==0O GC2AB28B5;L=>ABL :><5?@07>;C, 70<5I5==K< 15=78<8407>;0< 8;8 : :0>;;81> 2A?>< >30B5;L=>. <5?@07>;, :0: 8 4@C385 8=3818B>@K ?@>B>==>3> =0A>A0 (), =5 A;54C5B ?@8<5=OBL >4=>2@5<5==> A =5;D8=028@>< (A<. «□708<>459AB285 A 4@C38<8 ;5:0@AB25==K<8 A@54AB20<8 8 4@C385 284K 2708<>459AB289»).

708<>459AB285 A 4@C38<8 ;5:0@AB25==K<8 A@54AB20<8 8 4@C385 284K 2708<>459AB289.
;8O=85 ><5?@07>;0 =0 D0@<0>:8=5B8:C 4@C38E ;5:0@AB25==KE A@54AB2.
5:0@AB25==K5 A@54AB20, 2A0AK20=85 :>B>@KE 7028A8B >B @65;C4:0.
#3=5B5=85 65;C4>G=>9 A5:@5F88 2> 2@5 ;5G5=8O ><5?@07>;< 8 4@C38<8 ?@5?0@0B0<8 87 3@C??K <>65B A=860BL 8;8 ?>2KH0BL 01A>@1F8N ;5:0@AB25==KE A@54AB2, 2A0AK20=85 :>B>@KE 70 28A8B >B @65;C4:0.
5;D8=028@, 0B070=028@.
;07<5==K5 C@>2=8 =5;D8=028@0 8 0B070=028@0 A=860NBAO ?@8 >4=>2@5<5==>< ?@8<5=5=88 A > <5?@07>;>
4=>2@5<5==>5 ?@8<5=5=85 ><5?@07>;0 8 =5;D8=028@0 ?@>B82>?>:070=>. 4=>2@5<5==>5 =07=0G5=85 ><5?@07>;0 (40 <3 1 @07 2 ACB:8) A=860;> A@54=NN M:A?>78F8N =5;D8=028@0 ?@81;87 8B5;L=> =0 40 %, 0 A@54=OO M:A?>78F8O D0@<0>;>38G5A:8 0:B82=>3> <5B01>;8B0 8 A=860;0AL ?@81;878B5;L=> =0 75-90 %. 708<>459AB285 B0:65 <>65B 1KBL >1CA;>2;5=> C3=5B5=85< 0:B82=>AB8 CYP2C19.
4=>2@5<5==>5 ?@8<5=5=85 ><5?@07>;0 A 0B070=028@>< =5 @5:><5=4C5BAO. 4=>2@5<5==>5 ?@8 <5=5=85 ><5?@07>;0 (40 <3 1 @07 2 ACB:8) 8 0B070=028@0 2 4>75 300 <3/@8B>=028@0 2 4>75 100 <3 C 74>@>2KE 4>1@>2>;LF52 ?@82>48;> : A=865=8N =0 75 % M:A?>78F88 0B070=028@0. >2KH5=85 4>7 K 0B070=028@0 4> 400 <3 =5 :>8@>20;> 2;8O=85 ><5?@07>;0 =0 M:A?>78F8N 0B070=028@0. 4=>2@5 <5==>5 ?@8<5=5=85 ><5?@07>;0 (20 <3 1 @07 2 ACB:8) A 0B070=028@>< 2 4>75 400 <3/@8B>=028@>< 2 4>75 100 <3 C 74>@>2KE 4>1@>2>;LF52 ?@82>48;> : A=865=8N ?@81;878B5;L=> =0 30 % M:A?>78F 88 0B070=028@0 ?> A@02=5=8N A 0B070=028@>< 2 4>75 300 <3/@8B>=028@>< 2 4>75 100 <3 1 @07 2 ACB:8.
83>:A8=.

4=>2@5<5==>5 ;5G5=85 ><5?@07>;< (20 <3 2 ACB:8) 8 483>:A8=>< C 74>@>2KE 4>1@>2>;LF52
C25;8G820;> 18>4>ABC?=>ABL 483>:A8=0 =0 10 %. 54:> @538AB@8@>20;8AL A;CG08 B>:A8G=>AB8,
2K720==>9 ?@8<5=5=85< 483>:A8=0. 4=0:> A;54C5B ?@845@6820BLAO >AB>@>6=>AB8 ?@8 =0
7=0G5=88 2KA>:8E 4>7 ><5?@07>;0 ?0F85=B0< ?>68;>3> 2>7@0AB0. 5>1E>48<> CA8;8BL
B5@0?52B8G5A:89 ;5:0@AB25==K9 <=>8B>@8=3 483>:A8=0.
;>?84>3@5;L.

74>@>2KE 4>1@>2>;LF52 =01;N40;>AL D0@<0>:8=5B8G5A:>5 (\$)/D0@<0>48=0<8G5A:>5 (\$) 2708
<>459AB285 <564C ::>?84>3@5;5< (=03@C7>G=00 4>70 300 <3/ACB>G=00 ?>445@6820NI00 4>70 75
<3) 8 ><5?@07>;< (80 <3 2 ACB:8 ?5@>@0;L=>, B.5. 4>70, :>B>@00 2 4 @070 ?@52KH05B
AB0=40@B=CN 4=52=CN 4>7C), GB> ?@82>48;> : C<5=LH5=8N M:A?>78F88 0:B82=>3> <5B01>;8B0
::>?84>3@5;O 2 A@54=5< =0 46 % 8 C<5=LH5=8N <0:A8<0;L=>3> 8=3818@CNI53> 459AB280 (\$-8=4C
F8@>20==>9) 03@530F88 B@><1>F8B>2 2 A@54=5< =0 16 %. @>B82>@5G82K5 40==K5 2
>B=>H5=88 ::8=8G5A:8E ?@>O2;5=89 MB>3> \$/\$2708<>459AB280 A B>G:8 7@5=8O >A=>2=KE A5@
45G=>-A>AC48ABKE 701>;520=8O 1K;8 70@538AB@8@>20=K 2 E>45 ?@>2545=8O >1A5@20F8>==KE
8 ::8=8G5A:8E 8AA;54>20=89. :0G5AB25 <5@K ?@54>AB>@>6=>AB8 =5>1E>48<> 871530BL >4=>2@5
<5==>3> ?@8<5=5=8O ><5?@07>;0 8 ::>?84>3@5;O.

@C385 ;5:0@AB25==K5 A@54AB20.

A0AK20=85 ?>A0:>=07>;0, M@;>B8=810, :5B>:>=07>;0 8 8B@0:>=07>;0 7=0G8B5;L=> C<5=LH05BAO 8,
B0:8<>1@07><, ::8=8G5A:0O MDD5:B82=>ABL <>65B >A;01;OBLAO. !;54C5B 871530BL >4=>2@5
<5==>3> ?@8<5=5=8O A ?>A0:>=07>;< 8 M@;>B8=81>

5:0@AB25==K5 A@54AB20, :>B>@K5 <5B01>;878@CNBAO A CG0AB85< CYP2C19.

<5?@07>;>:07K205B C<5@5==>5 8=3818@CNI55 459AB285 =0 CYP2C19 (>A=>2=>9 D5@<5=B,
:>B>@K9 >B25G05B 70 <5B01>;87< ><5?@07>;0). "0:8<>1@07><, <5B01>;87< A?>CBAB2CNI8E ;5:0@A
B25==KE A@54AB2, :>B>@K5 B0:65 <5B01>;878@CNBAO A CG0AB85< CYP2C19, <>65B C<5=LH
0BLAO, 0 A8AB5<=0O M:A?>78F8O MB8E A@54AB2 C25;8G820BLAO. @8<5@>< B0:8E ?@5?0@0B>2
O2;O5BAO R-20@D0@8= 8 4@C385 0=B03>=8ABK 28B0<8=0 , F8;>AB07>;, 48075?0< 8 D5=8B>8=
?>AB07>;.

74>@>2KE 4>1@>2>;LF52 ?@8<5=5=85 ><5?@07>;0 2 4>75 40 <3 ?>2KH0;> !max 8 AUC F8;>AB07>;0
=0 18 % 8 26 % A>>B25BAB25==>, 0 >4=>3> 87 53> 0:B82=KE <5B01>;8B>2 =0 29 % 8 69 %
A>>B25BAB25==>.

\$5=8B>8=.

>=8B>@8=3 :>=F5=B@0F88 D5=8B>8=0 2 ?;07<5 :@>28 @5:><5=4C5BAO ?@>2>48BL 2 B5G5=85 ?5@
2KE 42CE =545;L ?>A;5 =0G0;0 ;5G5=8O ><5?@07>;< 8 2 A;CG05, 5A;8 1K;0 ?@>2545=0 :>@>5:F8O
4>7K D5=8B>8=0, <=>8B>@8=3 8 40;L=59HCN :>@>5:F8N 4>7K ?@5?0@0B0 =5>1E>48<> ?@>2>48BL
?>A;5 >:>=G0=8O ;5G5=8O ><5?@07>;>

58725AB=K9 <5E0=87

!0:28=028@.

4=>2@5<5==>5 ?@8<5=5=85 ><5?@07>;0 A A0:28=028@>=028@>< ?@82>48;> : C25;8G5=8N C@>2=59
A0:28=028@0 2 ?;07<5 :@>28 ?@81;878B5;L=> 4> 70 %, GB> 0AA>F88@>20;>AL A 4>;6=>9 ?5@5=>A8<
>ABLN C □'-8=D8F8@>20==KE ?0F85=B>2.

"0:@>;8

@8 >4=>2@5<5==>< ?@8<5=5=88 ><5?@07>;0 A>>1I0;>AL >1 C25;8G5=88 C@>2=O B0:@>;80 2 AK2>
@>B:5 :@>28. C6=> ?@>2>48BL CA8;5==K9 <=>8B>@8=3 :>=F5=B@0F88 B0:@>;80, 0 B0:65 DC=:F88
?>G5: (:8@5=A :@50B8=8=0), 8 ?@8 =5>1E>48<>AB8 >B:>@>5:B8@>20BL 4>78@>2:C B0:@>;80.

5B>B@5:A0B.

!>>1I0;>AL > ?>2KH5=88 C@>2=O <5B>B@5:A0B0 C =5:>B>@KE ?0F85=B>2 ?@8 >4=>2@5<5==><
?@85<5 A 8=3818B>@0<8 ?@>B>==>3> =0A>A0. A;CG05 =5>1E>48<>AB8 ?@8<5=5=8O <5B>B@5:A0B
0 2 2KA>:8E 4>70E A;54C5B @0AA<>B@5BL 2>?@>A > 2@5<5==>9 >B<5=5 ><5?@07>;0.

:8O=85 4@C38E ;5:0@AB25==KE A@54AB2 =0 D0@<0>:8=5B8:C ><5?@07>;0.

=3818B>@K CYP2C19 8/8;8 CYP3A4.

>A:>;L:C ><5?@07>; <5B01>;878@C5BAO A ?><>ILN D5@<5=B>2 CYP2C19 8 CYP3A4, ?@5?0@0BK
:>B>@K5, :0: 8725AB=>, C3=5B0NB 0:B82=>ABL CYP2C19 8;8 CYP3A4 (B0:85 :0: ;0@8B@><8F8= 8
2>@8:>=07>;), <>3CB ?@82>48BL : C25;8G5=8N C@>2=59 ><5?@07>;0 2 AK2>@>B:5 :@>28 2

@57C;LB0B5 70<54;5=8O A:>@>AB8 53> <5B01>;87<0. 4=>2@5<5==>5 ?@8<5=5=85 2>@8:>=07>;0
?@82>48;> : 1>;55 G5< 42CE:@0B=> @>ABC M:A?>78F88 ><5?@07>;0. >A:>;L:C 2KA>:85 4>7K >
<5?@07>;0 ?5@5=>A8;8AL E>@>H> , :>@>5:F8O 4>7K ><5?@07>;0. :0: ?@028;> , =5 =C6=0. 4=0:> A;54
C5B @0AA<>B@5BL 2>?@>A > :>@>5:F88 4>7K 4;O ?0F85=B>2 A BO65;>9 ?5G5=>G=>9 =54>AB0B
>G=>ABLN 8 2 A;CG05 4;8B5;L=>3> ;5G5=8O.
<5?@07>; G0AB8G=> <5B01>;878@C5BAO B0:65 CYP3A4, => =5 C3=5B05B MB>B D5@<5=B. "0:8<
>1@07>< , ><5?@07>; =5 2;8O5B =0 <5B01>;87< ?@5?0@0B>2, :>B>@K5 <5B01>;878@CNBAO CYP3A4,
B0:8E :0: F8;>A?>@8= , ;84>:08= , E8=848= , MAB@048>; , M@8B@><8F8= 8 1C45A>=84.
=4C:B>@K CYP2C19 8/8;8 CYP3A4.
@5?0@0BK :>B>@K5, :0: 8725AB=> , 8=4CF8@CNB 0:B82=>ABL CYP2C19 8;8 CYP3A4, 8;8 >1>8E D5@
<5=B>2 (B0:85 :0: @8D08F8= 8 725@>1>9), <>3CB ?@82>48BL : A=865=8N C@>2=59 ><5?@07>;0 2 A
K2>@>B:5 :@>28 2 @57C;LB0B5 C25;8G5=8O A:>@>AB8 53> <5B01>;87<0.

A>15==>AB8 ?@8<5=5=8O.

@8 =0;8G88 :0:>3>;81> >?0A=>3> A8<0 (=0?@8<5@, 7=0G8B5;L=0O ?>B5@O <0AAK B5;0, =5
>1CA;>2;5==0O 485B>9; G0AB0O @2>B0; 48AD038O; @2>B0 A ?@8<5ALN :@>28 8;8 <5;5=0) 8 :>340
5ABL 4803=>AB8@>20==0O O720 65;C4:0 8;8 ?>4>7@5=85 =0 55 =0;8G85, A;54C5B 8A;;NG8BL 7;>
:0G5AB25==>5 701>;520=85, ?>A:>;L:C ?@85< ?@5?0@0B0 <>65B <0A:8@>20BL 53> A8<K 8 70
45@6820BL >?@545;5=85 ?@028;L=>3> 4803=>70.
4=>2@5<5==>5 ?@8<5=5=85 0B070=028@0 A 8=3818B>@0<8 ?@>B>==>3> =0A>A0 =5 @5:><5=4C5
BAO. A;8 :>18=0F88 0B070=028@0 A 8=3818B>@>< ?@>B>==>3> =0A>A0 =5;L7O 871560BL, @5:>
<5=4C5BAO BI0B5;L=K9 ;8=8G5A:89 <=>8B>@8=3 (=0?@8<5@, 28@CA=0O =03@C7:0) 2 A>G5B0=88
A C25;8G5=85< 4>7K 0B070=028@0 4> 400 <3 =0 100 <3 @8B>=028@0; 4>70 ><5?@07>;0 =5 4>;6=0
?@52KH0BL 20 <3.
<5?@07>; , :0: 8 2A5 ;5:0@AB25==K5 A@54AB20, :>B>@K5 C3=5B0NB A5:@5F8N A>;O=>9 :8A;>BK
65;C4>G=>3> A>;0, <>65B C<5=LH8BL 2A0AK20=85 28B0<8=0 12 (F80=>:>10;0<8=0) 87-70 38?>- 8;8
0E;>@384@88. -B> A;54C5B CG8BK20BL ?0F85=B0< A =87:>9 <0AA>9 B5;0 8;8 D0:B>@0<8 @8A:0
>B=>A8B5;L=> A=865=8O 2A0AK20=8O 28B0<8=0 12 ?@8 4;8B5;L=>9 B5@0?88.
<5?@07>; O2;O5BAO 8=3818B>@>< CYP2C19. =0G0;5 8;8 ?@8 7025@H5=88 ;5G5=8O ><5?@07>;>
=5>1E>48<> @0AA<>B@5BL 2>7<>6=>ABL 2708<>459AB28O A ;5:0@AB25==K<8 A@54AB20<8,
:>B>@K5 <5B01>;878@CNBAO ?@8 CG0AB88 CYP2C19. 708<>459AB285 =01;N405BAO <564C ;:>?8
4>3@5;5< 8 ><5?@07>;>8=8G5A:0O 7=0G8<>ABL MB>3> 2708<>459AB28O >AB05BAO =5?>=OB=>9.
:0G5AB25 <5@K ?@54>AB>@>6=>AB8 =5>1E>48<> 871530BL >4=>2@5<5==>3> ?@8<5=5=8O >
<5?@07>;0 8 ;:>?84>3@5;O.
1>;L=KE, ?@8=8<02H8E 8=3818B>@K ?@>B>==>3> =0A>A0, 2;;NG0O ><5?@07>; , 2 B5G5=85 =5 <5=5
5 B@5E <5AOF52 2>7=8:0;0 BO65;0O 38?><03=85<8O (2 1>;LH8=AB25 A;CG052 38?><03=85<88
1>;L=K5 ?@8<5=O;8 ?@5?0@0B >:>;> 3>40). 8?><03=85<8N <>6=> 70?>4>7@8BL ?> B0:8< A5@L57=K<
?@>O2;5=8O< :0: CB><;O5<>ABL, AC4>@>38, 45;8@89, 3>;>2>:@C65=85, 65;C4>G:>20O 0@8B<8O.
4=0:> A;54C5B 8<5BL 2284C, GB> 2 @O45 A;CG052 ?@>O2;5=8O <>3CB 1KBL 70<0A:8@>20=K, GB>
<5H05B A2>52@5<5==> @0A?>7=020=8N B0:>3> >A;>6=5=8O. # 1>;LH8=AB20 1>;L=KE ?@>O2;5=8O 3
8?><03=85<88 8AG570NB 8 A>AB>O=85 =>@<0;87C5BAO ?>A;5 ?@8<5=5=8O ?@5?0@0B>2 <03=8O 8
>B<5=K 8=3818B>@>2 ?@>B>==>3> =0A>A0.
5G5=85 8=3818B>@0<8 ?@>B>==>3> =0A>A0 <>65B ?@825AB8 : =5A:>;L:> ?>2KH5==> @8A:C @0
728B8O 8=D5:F89 65;C4>G=>:-8H5G=>3> B@0:B0, 2K720==KE *Salmonella* 8 *Campylobacter*.
0F85=BK, :>B>@K< ?;0=8@C5BAO 4;8B5;L=>5 ?@8<5=5=85 8=3818B>@>2 ?@>B>==>9 ?>>2<5AB=>5
?@8<5=5=85 483>:A8=0, 8;8 4@C38E ;5:0@AB25==KE A@54AB2, :>B>@K5 <>3CB 2K7K20BL C<5=L
H5=85 A>45@60=8O <03=8O (=0?@8<5@ 48C@5B8:>2), =5>1E>48<> >?@545;OBL :>=F5=B@0F8N <03=
8O 2 AK2>@>B:5 :@>28 4> =0G0;0 ?@8<5=5=8O 8=3818B>@>2 ?@>B>==>9 ?>K 8 ?5@8>48G5A:8 =0
?@>BO65=88 ;5G5=8O.
=3818B>@K ?@>B>==>9 ?>K, >A>15==> ?@8 ?@8<5=5=88 2 2KA>:8E 4>70E 8 2 B5G5=85 4;8B5;L=>3>
2@5<5=8 (> 1 3>40), <>3CB =5A:>;L:> ?>2KA8BL @8A: ?5@5;><>2 ?>72==>G=8:0, :>AB59 70?OABLO 8
154@0, >A>15==> C ;N459 ?>68;>3> 2>7@0AB0 8 ?@8 =0;8G88 ?@54@0A?>;030NI8E D0:B>@>2.

!>3;0A=> 8AA;54>20=8O< 8=3818B>@K ?@>B==>9 ?>K <>3CB ?>2KA8BL >1I89 @8A: ?5@5;<>2 =0
10-40 %. '0AB8G=> MB> C25;8G5=85 @8A:0 <>65B 1KBL A2O70=> A 4@C38<8 D0:B>@0<8 @8A:0.
0F85=BK A @8A:<> @0728B8O >AB5>?>@>70 4>;6=K ?>;CG0BL ?><>IL 2 A>>B25BAB288 A 4
59AB2CNI8<8 ::8=8G5A:8<8 @5:<>5=40F8O<8 8 4>;6=K 8<5BL 045:20B=>5 C?>B@51;5=85 28B0<8=0 D
8 :0;LF8O.

:8O=85 =0 @57C;LB0BK ;01>@0B>@=KE 8AA;54>20=89.

@8 ?@8<5=5=88 <>5?@07>;0 2>7<>6=> ?>2KH5=85 :=F5=B@0F88 E@><>3@0=8=0 (CgA). >2KH5=85
:=F5=B@0F88 CgA <>65B 2;8OBL =0 @57C;LB0BK >1A;54>20=89 4;O 2KO2;5=8O =59@>M=4>:@8==K
E >?CE>;59. ;O ?@54C?@5645=8O 40==>3> 2;8O=8O =5>1E>48<> 2@5<5==> ?@5:@0B8BL ?@85< >
<5?@07>;0 70 5 4=59 4> ?@>2545=8O 8AA;54>20=8O :=F5=B@0F88 CgA.

5:>B>@K5 45B8 A E@>=8G5A:8<8 701>;520=8O<8 =C640NBAO 2 4;8B5;L=<> ;5G5=88, E>BO B0:>5 ;
5G5=85 =5 @5:<>5=4>20=>.

0F85=BK, :>B>@K5 ?@8<5=ONB ?@5?0@0B =0 ?@>BO65=88 4;8B5;L=>3> ?5@8>40 (>A>15==> :>340
?5@8>4 ;5G5=8O 4;8BAO 1>;55 1 3>40) 4>;6=K =0E>48BLAO ?>4 @53C;O@=K< <548F8=A:8< =0
1;N45=85<.

@5?0@0B A>45@68B A0E0@>7C, ?>MB>5A;8 C ?0F85=B0 CAB0=>2;5=0 =5?5@5=>A8<>ABL
=5:>B>@KE A0E0@>2, A;54C5B ?@>:=AC;LB8@>20BLAO A 2@0G<, ?@5645 G5< ?@8=8<0BL MB>
;5:0@AB25==>5 A@54AB2>.

5:0@AB25==>5 A@54AB2> A>45@68B =0B@8O<5B8;?0@015= (219) 8 =0B@8O ?@>?8;?0@015= (217)
, :>B>@K5 <>3CB 2K720BL 0;;5@38G5A:85 @50:F88 (2>7<>6=>, 70<54;5==K5).

-B> ;5:0@AB25==>5 A@54AB2> A>45@68B <5=55 1 <<>;L/4>7C =0B@8O, B> 5ABL ?@0:B8G5A:8
A2>1>4=> >B =0B@8O.

@8<5=5=85 2 ?5@8>4 15@5<5==>AB8 8;8 :>@<;5=8O 3@C4LN.

5@5<5==>ABL.

57C;LB0BK, ?>;CG5==K5 2 E>45 B@5E ?@>A?5:B82=KE M?845<8>;>38G5A:8E 8AA;54>20=89 (1>;55
1000 ?>;CG5==KE @57C;LB0B>2), C:07K20NB =0 >BACBAB285 =565;0B5;L=>3> 2;8O=8O <>5?@07>;
=0 15@5<5==>ABL 8;8 74>@>2L5 ?>;>40/=>2>@>645==>3>. <5?@07>; <>6=> ?@8<5=OBL 2 ?5@8>4
15@5<5==>AB8.

>@<;5=85 3@C4LN.

<5?@07>; ?@>=8:05B 2 3@C4=>5 <>;>;>, >4=0:> A <0;>9 25@>OB=>ABLN <>65B 2;8OBL =0 @515=:0,
5A;8 53> ?@8<5=OBL 2 B5@0?52B8G5A:8E 4>70E.

5?@>4C:B82=0O DC=:F8O

5@>@0;L=>5 ?@8<5=5=85 @0F5<8G5A:>9 A<5A8 <>5?@07>;0 ?@8 8AA;54>20=8OE =0 682>B=KE =5
2;8O;> =0 @5?@>4C:B82=CN DC=:F8N.

!>A>1=>ABL 2;8OBL =0 A:>@>ABL @50:F88 ?@8 C?@02;5=88 02B>B@0=A?>@B>< 8;8 4@C38<8
<5E0=87<0<8.

0;>25@>OB=>, GB> ?@5?0@0B 2;8O5B =0 A?>A>1=>ABL C?@02;OBL B@0=A?>@B=K<8 A@54AB20
<8 8;8 @01>B0BL A <5E0=87<0<8. >3CB =01;N40BLAO B0:85 =565;0B5;L=K5 @50:F88 =0 ?@8<5=5=85
?@5?0@0B0 :0: 3>;>2>:@C65=85 8 =0@CH5=85 7@5=8O. □A;8 B0:85 @0AAB@>9AB20 =01;N40NBAO,
?0F85=BK =5 4>;6=K C?@02;OBL B@0=A?>@B=K<8 A@54AB20<8 8;8 @01>B0BL A <5E0=87<0<8.

!>A>1 ?@8<5=5=8O 8 4>7K.

>78@>2:0 4;O 27@>A;KE.

5G5=85 8 ?@>D8;0:B8:0 O72K 425=04F0B8?5@AB=>9 :8H:8 8 4>1@>:0G5AB25==>9 O72K 65;C4:0, 2
B>< G8A;5 A2O70==KE A ?@85<>< =5AB5@>84=KE ?@>B82>2>A?0;8B5;L=KE A@54AB2 (□!).

5:><5=4>20==0O 4>70 4;O ?0F85=B>2 A O72>9 425=04F0B8?5@AB=>9 :8H:8 A>AB02;O5B 20 <3 >
<5?@07>;0 1 @07 2 ACB:8. # 1>;LH8=AB20 ?0F85=B>2 O720 425=04F0B8?5@AB=>9 :8H:8 7068205B 2
B5G5=85 2 =545;L. ;O ?0F85=B>2, C :>B>@KE =5 ?@>8AE>48B ?>;=>3> 70682;5=8O ?>A;5 =0G0;L=>3>
:C@A0, @5:<>5=4C5BAO 40;L=59H55 ;5G5=85 =0 ?@>BO65=88 2 =545;L. BO65;KE 8;8 @5F84828@
CNI8E A;CG0OE @5:<>5=4C5BAO 40 <3 <>5?@07>;0 2 ACB:8 8 70682;5=85 >1KG=> 4>AB8305BAO 2
B5G5=85 4 =545;L.

;O ?@>D8;0:B8:8 @5F84820 O72K 425=04F0B8?5@AB=>9 :8H:8 C ?0F85=B>2 A =530B82=K<
@57C;LB0B>< B5AB0 =0 H. pylori @5:><5=4>20==0O 4>70 A>AB02;O5B 20 <3 ><5?@07>;0 1 @07 2
ACB:8. ;O =5:>B>@KE ?0F85=B>2 <>65B 1KBL 4>AB0B>G=>9 ACB>G=0O 4>70 10 <3*. A;CG05
=54>AB0B>G=>9 B5@0?88 4>7C <>6=> ?>2KA8BL 4> 40 <3.
@8 ;5G5=88 O72K 65;C4:0 @5:><5=4>20==0O 4>70 A>AB02;O5B 20 <3 ><5?@07>;0 1 @07 2 ACB:8. # 1>
;LH8=AB20 ?0F85=B>2 O720 65;C4:0 7068205B 2 B5G5=85 4 =545;L. 0F85=B0<, C :>B>@KE =5
?@>8AE>48B ?>;=>3> 70682;5=8O ?>A;5 =0G0;L=>3> :C@A0, @5:><5=4C5BAO 40;L=59H55 ;5G5=85 =0
?@>BO65=88 4 =545;L. BO65;KE 8;8 @5F84828@CNI8E A;CG0OE @5:><5=4C5BAO 40 <3 ><5?@07>;0
2 ACB:8 8 70682;5=85 >1KG=> 4>AB8305BAO 2 B5G5=85 8 =545;L.
;O ?@>D8;0:B8:8 @5F84820 C ?0F85=B>2 A O72>9 65;C4:0 8 =54>AB0B>G=>9 @50:F859 2 >B25B =0 ;
5G5=85 @5:><5=4>20==0O 4>70 A>AB02;O5B 20 <3 ><5?@07>;0 1 @07 2 ACB:8. @8 =5>1E>48<>AB8
4>7C <>6=> C25;8G8BL 4> 40 <3 1 @07 2 ACB:8.
;O ;5G5=8O O72 65;C4:0 8 425=04F0B8?5@AB=>9 :8H:8, A2O70==KE A ?@8<5=5=85< =5AB5@>84=KE
?@>B82>2>A?0;8B5;L=KE ;5:0@AB25==KE A@54AB2, @5:><5=4>20==0O 4>70 A>AB02;O5B 20 <3 >
<5?@07>;0 1 @07 2 ACB:8. # 1>;LH8=AB20 ?0F85=B>2 70682;5=85 =0ABC?05B 2 B5G5=85 4 =545;L. 0F85
=B0<, C :>B>@KE =5 ?@>8AE>48B ?>;=>3> 70682;5=8O ?>A;5 =0G0;L=>3> :C@A0, @5:><5=4>20=>
40;L=59H55 ;5G5=85 =0 ?@>BO65=88 4 =545;L.
;O ?@>D8;0:B8:8 O72 65;C4:0 8 425=04F0B8?5@AB=>9 :8H:8, A2O70==KE A ?@8<5=5=85< =5AB5@>8
4=KE ?@>B82>2>A?0;8B5;L=KE ;5:0@AB25==KE A@54AB2, 4;O ?0F85=B>2, 8<5NI8E ?>2KH5==K9 @8
A: (2>7@0AB >60 ;5B, =0;8G85 2 ?@>H;>< O72 65;C4:0 8 425=04F0B8?5@AB=>9 :8H:8, :@>2>B5G5=8O
2 25@E=5< >B45;5 65;C4>G=>-.8H5G=>3> B@0:B0), @5:><5=4>20==0O 4>70 A>AB02;O5B 20 <3 >
<5?@07>;0 1 @07 2 ACB:8.
-@048:0F8O H. pylori ?@8 ?5?B8G5A:>9 O725.
;O M@048:0F88 H. @ylori ?@8 2K1>@5 0=B810:B5@80;L=KE ;5:0@AB25==KE A@54AB2 A;54C5B
CG8BK20BL 8=48284C0;L=CN ?5@5=>A8<>ABL ?@5?0@0B0 8 ?@845@6820BLAO A>>B25BAB289 =0F
8>=0;L=K<, @538>=0;L=K< 8 <5AB=K< >A>15==>ABO< 8 @C:>2>4AB20< ?> ;5G5=8N.
- (<5?@07>;0 20 <3 + ;0@8B@><8F8=0 500 <3 + 0<:A8F8;;8=0 1000 <3) 2 @070 2 ACB:8 2 B5G5=85 1
=545;8, 8;8
- (<5?@07>;0 20 <3 + ;0@8B@><8F8=0 250 <3 (?@8 =5>1E>48<>AB8 500 <3) + <5B@>=8407>;0 400 <3
(?@8 =5>1E>48<>AB8 500 <3 8;8 B8=8407>;0 500 <3)) 2 @070 2 ACB:8 2 B5G5=85 1 =545;8, 8;8
- <5?@07>;0 40 <3 1 @07 2 ACB:8 + (0<:A8F8;;8=0 500 <3 + <5B@>=8407>;0 400 <3 (?@8 =5>1E>48<
>AB8 500 <3 8;8 B8=8407>;0 500 <3)) 3 @070 2 ACB:8 2 B5G5=85 1 =545;8.
5G5=85 30AB@>M7>D0350;L=>9 @5D;N:A=>9 1>;57=8, 2 B.G. @5D;N:A-M7>D038B0.
5:><5=4>20==0O 4>70 A>AB02;O5B 20 <3 ><5?@07>;0 1 @07 2 ACB:8. # 1>;LH8=AB20 ?0F85=B>2
2K74>@>2;5=85 =0ABC?05B 2 B5G5=85 4 =545;L. 0F85=B0<, C :>B>@KE =5 ?@>8AE>48B ?>;=>3>
2K74>@>2;5=8O ?>A;5 =0G0;L=>3> :C@A0, @5:><5=4>20=> 40;L=59H55 ;5G5=85 2 B5G5=85 4
=545;L. ;O ?0F85=B>2 A BO65;K< M7>D038B>< @5:><5=4C5BAO 40 <3 ><5?@07>;0 2 ACB:8, ?@8 MB>
< 2K74>@>2;5=85 >1KG=> 4>AB8305BAO 2 B5G5=85 8 =545;L.
;O 4;8B5;L=>3> ;5G5=8O ?0F85=B>2 A 30AB@>M7>D0350;L=>9 @5D;N:A=>9 1>;57=LN @5:><5=4>20=
=0O 4>70 A>AB02;O5B 10 <3* ><5?@07>;0 1 @07 2 ACB:8. @8 =5>1E>48<>AB8 4>7C <>6=> ?>2KA8BL
4> 20-40 <3 ><5?@07>;0 1 @07 2 ACB:8.
@8 ;5G5=88 A8<>2 30AB@>M7>D0350;L=>9 @5D;N:A=>9 1>;57=8 @5:><5=4>20==0O 4>70 A>AB0
2;O5B 20 <3 ><5?@07>;0 1 @07 2 ACB:8. 0F85=BC <>65B 1KBL 4>AB0B>G=0 4>70 10 <3*, 4>7C A;54
C5B :>@@5:B8@>20BL 2 8=48284C0;L=>< ?>@O4:5. □A;8 =5 4>AB8305BAO 65;0B5;L=K9 @57C;LB0B
?>A;5 4 =545;L ;5G5=8O ><5?@07>;< 2 4>75 20 <3 2 ACB:8, ?0F85=B0 A;54C5B 4>?>;=8B5;L=> >1A;5
4>20BL.
5G5=85 A8=4@><0 >;;8=35@0--;;8A>=0.
;O ?0F85=B>2 A A8=4@>< >;;8=35@0--;;8A>=0 ?>41>@ 4>7K A;54C5B ?@>2>48BL 8=48284C0;L=>.
5G5=85 4;8BAO 4> 8AG57=>25=8O ;8=8G5A:8E ?@>O2;5=89 1>;57=8. 5:><5=4>20==0O =0G0;L=0O 4>70
A>AB02;O5B 60 <3 ><5?@07>;0 1 @07 2 ACB:8. 01;N45=85 1>;55 G5< 70 90 % ?0F85=B>2 A BO65;K<8
701>;520=8O<8 8 =54>AB0B>G=>9 @50:F859 =0 4@C385 284K ;5G5=8O 2KO28;> MDD5:B82=>ABL ?>4
45@6820NI59 B5@0?88 2 4>70E 20-120 <3 2 ACB:8. !CB>G=CN 4>7C 2KH5 80 <3 A;54C5B @0745;8BL 8
?@8<5=OBL 70 2 ?@85<0.
>78@>2:0 4;O 45B59.
5B8 A 1 3>40 8 <0AA>9 B5;0 ≥10 :3.

5G5=85 @5D;N:A-M7>D038B0.
!8<0B8G5A:>5 ;5G5=85 876>38 8 :8A;>B=>9 @53C@38B0F88 ?@8 30AB@>M7>D0350;L=>9
@5D;N:A=>9 1>;57=8.

5:><5=40F88 ?> 4>78@>2:5:

>7@0AB	0AA0 B5;0	>78@>2:0
≥ 1 3>40	10-20 :3	10 <3* 1 @07 2 ACB:8. @8 =5>1E>48<>AB8 4>7C <>6=> ?>2KA8BL 4> 20 <3 1 @07 2 ACB:8.
5BO< A <0AA>9 B5;0 1>;55 20 :3		20 <3 1 @07 2 ACB:8. @8 =5>1E>48<>AB8 4>7C <>6=> ?>2KA8BL 4> 40 <3 1 @07 2 ACB:8.

5G5=85 @5D;N:A-M7>D038B0: 4;8B5;L=>ABL ;5G5=8O A>AB02;O5B 4-8 =545;L.
!8<0B8G5A:>5 ;5G5=85 876>38 8 :8A;>B=>9 @53C@38B0F88 ?@8 30AB@>M7>D0350;L=>9
@5D;N:A=>9 1>;57=8: 4;8B5;L=>ABL ;5G5=8O 2-4 =545;8. □A;8 =5 4>AB8305BAO 65;05 @57C;LB0B ?>
A;5 2-4 =545;L, ?0F85=B0 A;54C5B 4>?>;=8B5;L=> >1A;54>20BL.
5B8 8 ?>4@>AB:8 A 4 ;5B.
5G5=85 O72K 425=04F0B8?5@AB=>9 :8H:8, 2K720==>9 H. @ylori
K1>@ A>>B25BAB2CNI59 :><18=0F8>==>9 B5@0?88 4>;65= ?@>E>48BL 2 A>>B25BAB288 A>D8F
80;L=K<8 =0F8>=0;L=K<8, @538>=0;L=K<8 8 <5AB=K<8 >A>15==>ABO<8 10:B5@80;L=>9
@578AB5=B=>AB8. "0:65 A;54C5B CG8BK20BL 4;8B5;L=>ABL ;5G5=8O (>B 7 4> 14 4=59) 8
A>>B25BAB2CNI55 ?@8<5=5=85 0=B810:B5@80;L=KE ?@5?0@0B>2. 5G5=85 4>;6=> ?@>2>48BLAO ?>
4 =01;N45=85< 2@0G0.

5:><5=40F88 ?> 4>78@>2:5:

0AA0 B5;0	>78@>2:0
15-30 :3	<5?@07>; 10 <3* + 0<>:A8F8;;8= 25 <3/:3 <0AAK B5;0 + ;;0@8B@><8 F8= 7,5 <3/:3 <0AAK B5;0. @5?0@0BK ?@8=8<0BL 2<5AB5 2 @07 0 2 ACB:8 2 B5G5=85 1 =545;8.
31-40 :3	<5?@07>; 20 <3 + 0<>:A8F8;;8= 750 <3 + ;;0@8B@><8F8= 7,5 <3/:3 <0A AK B5;0. @5?0@0BK ?@8=8<0BL 2<5AB5 2 @070 2 ACB:8 2 B5G5=85 1 =545;8.
> 40 :3	<5?@07>; 20 <3 + 0<>:A8F8;;8= 1000 <3 + ;;0@8B@><8F8= 500 <3. @5?0@0BK ?@8=8<0BL 2<5AB5 2 @070 2 ACB:8 2 B5G5=85 1 =545;8.

* - A;CG05 =5>1E>48<>AB8 ?@8<5=5=8O 4>7K 10 <3 ?@8<5=OBL ?@5?0@0B 2 A>>B25BAB2CNI59 4>7
8@>2:5.
A>1K5 3@C??K ?0F85=B>2.
0@CH5=85 DC=:F89 ?>G5:.; O ?0F85=B>2 A =0@CH5=8O<8 DC=:F89 ?>G5: =5 =C6=0 :>@@@5:F8O 4>7
K (A<. @0745; «\$0@<0>:8=5B8:0»).

0@CH5=85 DC=:F89 ?5G5=8. ;O ?0F85=B>2 A =0@CH5=8O<8 DC=:F89 ?5G5=8 4>AB0B>G=0
ACB>G=0O 4>70 10-20 <3 (A<. @0745; «\$0@<0>:8=5B8:0»).

0F85=BK ?>68;>3> 2>7@0AB0 (>65 ;5B). ;O ?0F85=B>2 ?>68;>3> 2>7@0AB0 =5 =C6=0 :>@@@5:F8O 4>7
K (A<. @0745; «\$0@<0>:8=5B8:0»).

5:><5=4C5BAO ?@8=8<0BL :0?AC;K CB@><, 65;0B5;L=> 4> 54K, =5 ?>2@5640O :0?AC;C (:0?AC;K =5
A;54C5B @07652K20BL 8;8 @07;0<K20BL) 8 70?820O =51>;LH8< :>;8G5AB2>< 2>4K.
;O ?0F85=B>2 A B@C4=>ABO<8 3;>B0=8O 8 4;O 45B59, :>B>@K5 <>3CB ?8BL 8;8 3;>B0BL ?>;C
B25@4CN ?8IC. 0?AC;K <>6=> >B:@KBL 8 =5?>A@54AB25==> 3;>B=CBL A>45@68<>5, 70?820O
?>;>28=>9 AB0:0=0 2>4K, 8;8 @07<5H0BL 2 A;01>;8A;>9 684>AB8, =0?@8<5@, 2 :0:><;81> D@C:B>2>
<A>;5 8;8 O1;>G=>< ?N@5, 8;8 2 =5A>;5=>9 2>45. "0:CN A<5AL =5>1E>48<> 2K?8BL =5<54;5==> ?>A;5
?@83>B>2;5=8O 8;8 2 B5G5=85 30 <8=CB. 5@54 ?@85<>< A<5AL A;54C5B 271>;B0BL 8 70?8BL
?>;>28=>9 AB0:0=0 2>4K. 5 8A?>;L7>20BL <>;>;> 8;8 3078@>20==CN 2>4C.

5B8.

@5?0@0B ?@8<5=OBL 45BO< A 1 3>40 8 <0AA>9 B5;0 1>;55 10 :3 ?> =07=0G5=8N 2@0G0 ?> ?>:070=8O
< @5D;N:A-M7>D038B 8 A8<0B8G5A:>5 ;5G5=85 876>38 8 :8A;>B=>9 @53C@38B0F88 ?@8 30AB@>M
7>D0350;L=>9 @5D;N:A=>9 1>;57=8 8 45BO< A 4 ;5B 4;O ;5G5=8O O72K 425=04F0B8?5@AB=>9 :8H:8,
>1CA;>2;5=>9 =0;8G85< H. @ylori, ?>4 :>=B@>;5< 2@0G0.

5@54>78@>2:0.

725AB=K >G5=L >3@0=8G5==K5 40==K5 >1 MDD5:B0E ?5@54>78@>2:8 <<5?@07>;0 C G5;>25:0.
;8B5@0BC@5 1K;8 >78A0=K 4>78@>2:8 4> 560 <3 <<5?@07>;0 8 ?>;CG5=K 548=8G=K5 A>>1I5=8O >
4>AB865=88 @07>2>9 ?5@>@0;L=>9 4>7K 2 2400 <3 <<5?@07>;0 (2 120 @07 2KH5 >1KG=>9 @5:>
<5=4>20==>9 ;8=8G5A:>9 4>7K). !>>1I0;>AL > B>H=>B5, @2>B5, 3>;>2>:@C65=88, 014<<8=0;L=>9 1>;
8, 480@55 8 3>;>2=>9 1>;8. "0:65 2 548=8G=KE A;CG0OE A>>1I0;>AL >1 0?0B88, 45?@5AA88 8 A?CB0=
>AB8 A>7=0=8O.

?8A0==K5 A8<K 8<5NB 1KAB@>?@5E>4OI89 E0@0:B5@. !:>@>ABL 2K2545=8O =5 87<5=O5BAO (:8
=5B8:0 ?5@2>3> ?>@04:0) A C25;8G5=85< 4>7K. 5G5=85 ?@8 =5>1E>48<>AB8 A8<0B8G5A:>5.

>1>G=K5 @50:F88.

!00ABK<8 ?>1>G=K<8 MDD5:B0<8 O2;ONBAO 3>;>2=0O 1>;L, 014<<8=0;L=0O 1>;L, 70?>@, 480@5O, 2
74CB85 682>B0 8 B>H=>B0/@2>B0. K;8 2KO2;5=K 8;8 ACI5AB2>20;> ?>4>7@5=85 > A;54CNI8E
A;CG0OE ?>1>G=KE @50:F89 =0 ?@5?0@0B 2> 2@5 ?@>2545=8O ;8=8G5A:8E 8AA;54>20=89 >
<5?@07>;0 8;8 ?>AB<0@:5B8=3>2>3> ?@8<5=5=8O. 865 ?@82545=K ?>1>G=K5 @50:F88, :;0AA8D8F8@
>20==K5 2 A;54CNI85 3@C??K A>>B25BAB25==> 8E 2;8O=8N =0 >@30=K 8;8 A8AB5<K >@30=>2.
!> AB>@>=K A8AB5<K :@>28 8 ;85A:>9 A8AB5<K :;59:>?5=8O, B@><1>F8B>?5=8O, 03@0=C;>F8B>7,
?0=F8B>?5=8O.

!> AB>@>=K 8<9 A8AB5<K: @50:F88 ?>2KH5==>9 GC2AB28B5;L=>AB8, =0?@8<5@ ;8E>@04:0, 0=38
>=52@>B8G5A:89 >B5: 8 0=0D8;0:B8G5A:0O @50:F8O/H>:.

!> AB>@>=K <5B01>;87<0 8 ?8I520@5=8O: 38?>=0B@85<8O, 38?><03=85<8O, BO65;0O 38?><03=85<8
O <>65B ?@825AB8 : 38?>:0;LF85<88; 38?><03=85<8O, :>B>@0O <>65B 2K720BL 38?>:0;85<8N.

!> AB>@>=K ?A8E8:8: 15AA==8F0, 2>71C645=85, A?CB0==>ABL A>7=0=8O, 45?@5AA8O, 03@5AA8
O, 30;NF8=0F88.

!> AB>@>=K =5@2=>9 A8AB5<K: 3>;>2=0O 1>;L, 3>;>2>:@C65=85, ?0@5AB5788, A>=;82>ABL, =0
@CH5=8O 2:CA0.

!> AB>@>=K >@30=>2 7@5=8O: =5G5B:>ABL 7@5=8O.

!> AB>@>=K >@30=>2 A;CE0 8 ;018@8=B0: 25@B83>.

5A?8@0B>@=K5, B>@0:0;L=K5 8 <5480AB8=0;L=K5 =0@CH5=8O: 1@>=E>A?07

!> AB>@>=K 65;C4>G=>:-8H5G=>3> B@0:B0: 014<<8=0;L=0O 1>;L, 70?>@, 480@5O, 274CB85
682>B0, B>H=>B0/@2>B0, ACE>ABL 2> @BC, AB<0B8B, :0=484>7 65;C4>G=>:-8H5G=>3> B@0:B0, <8
:@>A:>?8G5A:89 :>;8B.

!> AB>@>=K ?5G5=8 8 65;G52K2>4OI8E ?CB59: ?>2KH5==K9 C@>25=L D5@<5=B>2 ?5G5=8, 35?0B8B
A 8;8 157 65;BCE8, ?5G5=>G=0O =54>AB0B>G=>ABL, M=F5D0;>?0B8O C ?0F85=B>2 A C65
ACI5AB2CNI59 1>;57=LN ?5G5=8.

!> AB>@>=K :>68 8 ?>4:>6=KE B:0=59: 45@<0B8B, 7C4, AK?L, :@0?82=8F0, 0;>?5F8O, D>B>GC2AB2
8B5;L=>ABL, ?>;8<>@D=0O M@8B5<0, A8=4@< !B825=c0-6>=A>=0, B>:A8G5A:89 M?845@<0;L=K9
=5:@>;87.

!> AB>@>=K >?>@>=-42830B5;L=>3> 0??0@0B0: 0@B@0;38O, <80;38O, <KH5G=0O A;01>ABL,
?5@5;><K 154@0, 70?OABLO 8;8 ?>72==>G=8:0.

!> AB>@>=K ?>G5: 8 <>G52K2>4OI8E ?CB59: 8=B5@AB8F80;L=K9 =5D@8B.

!> AB>@>=K ?>;>2>9 A8AB5<K 8 <>;>G=KE 65;57: 38=5:<0AB8O.

1I85 =0@CH5=8O: =54><>30=85, ?5@8D5@8G5A:89 >B5:, CA8;5==>5 ?>B>2K45;5=85.

0F85=BK 45BA:>3> 2>7@0AB0.

57>?0A=>ABL <<5?@07>;0 ?>@545;O;8 4;O 310 45B59 >B 0 4> 16 ;5B A :8A;>B>7028A8. !CI5AB2CNB >
3@0=8G5==K5 40==K5 >4>;3>A@>G=>< 87CG5=88 157>?0A=>AB8 ?@8<5=5=8O ?@5?0@0B0 C 46 45
B59, ?>;CG02H8E ?>445@6820NICN B5@0?8N <<5?@07>;< 2 ?@>F5AA5 ;5G5=8O BO65;>3> M@>782
=>3> M7>D038B0 2 B5G5=85 749 4=59. @>D8;L ?>1>G=KE @50:F89 AE>6 A ?@>D8;5< C 27@>A;KE
?@8 :@0B:>2@5<5==>< 8 4;8B5;L=><;5G5=88.

0==KE > 2;8O=88 ><5?@07>;0 =0 @>AB 8 ?>;>2>5 A>7@520=85 ?> @57C;LB0B0< 4;8B5;L=>3>=01;N45=8O =5B.

!**@>: 3>4=>AB8.** 3 3>40.
5 ?@8<5=OBL ?@5?0@0B ?>A;5 >:=G0=8O A@>:0 3>4=>AB8, C:070==>3> =0 C?0:>2:5.

#A;>28O E@0=5=8O.
%@0=8BL 2 >@838=0;L=>9 C?0:>2:5 ?@8 B5>!.
%@0=8BL 2 =54>ABC?=>< 4;O 45B59 <5AB5.

#?0:>2:0.
> 10 :0?AC; 2 1;8AB5@5. > 1 8;8 3 1;8AB5@0 2 ?0G:5.

0B53>@8O >B?CA:0. > @5F5?BC.

@>872>48B5;L.
«\$0@<0:».

5AB>=0E>645=85 ?@>872>48B5;O 8 53> 04@5A <5AB0 >ACI5AB2;5=8O 45OB5;L=>AB8.
#:@08=0, 04080, 3. 852, C;. \$@C=75, 74.